ADJUSTMENT AND MAINTENANCE OF THE LINOTYPE ELEKTRON

ASSEMBLING AND LINE DELIVERY

SERVICE INSTRUCTION NO. 22

SALES-SERVICE DEPARTMENT
MERGENTHALER LINOTYPE COMPANY
a Division of ELTRA Corporation
29 Ryerson St., Brooklyn, N.Y. 11205

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JUNE, 1964

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Printed in U.S.A.

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ADJUSTMENT AND MAINTENANCE OF THE LINOTYPE ELEKTRON

ASSEMBLING AND LINE DELIVERY

These instruction sheets describe the adjustments necessary to obtain proper operation of the Elektron, particularly at high speed (15 lines per minute) when operated automatically from tape. The adjustments outlined, however, can also be used for an Elektron which is operated manually.

Machine adjustments which are the same as on other model Linotypes and which are considered normal adjustments, have been omitted from this Service Instruction.

A description of the electrical circuits in the Elektron, together with other electrical information, is given in "The Elektron Electrical System" Service Instruction No. 21. However, the setting and correct adjustment of all switches is given in this Service Instruction No. 22.

LEVELING OF MACHINE

For proper operation of the Elektron, it is essential that the machine be level and that it rests on a good foundation. The machine must be level or even slightly higher (approximately 1/4") on the magazine side. A slight lean to the left will keep the lower end of the matrix against the distributor screw.

The Elektron should rest on a floor which is sturdy enough to prevent excessive vibration of the Elektron, particularly when it is operated at 15 lines per minute.

ASSEMBLING OF MATRICES

In order to assemble matrices properly, it is essential that all adjustments which affect assembling not only be made correctly, but be checked at frequent intervals to make sure these settings have not changed.

A card with a daily check list of settings is enclosed at the back of this Service Instruction. These settings should be checked each morning, before the Elektron is used in production, particularly if the Elektron is cycling at 15 lines per minute.

In the following adjustments for the assembling of matrices, settings which have an asterisk are those which should be checked daily.

(A) Keyboard (Fig. 1)

Make certain that there is sufficient keyboard cam overthrow spring action (1/16"). This is easily checked by observing the action of the overthrow springs as shown in the illustration.

When the keyboard cam is at rest, there should be .010" clearance between the keyboard plunger and the cam yoke. If the plunger binds

the cam yoke when the cam is at rest, the fall of the keyboard cam onto the keyboard rubber roll will be retarded and transpositions will result.

The clearance between the keyboard rod, short, in the keyboard and the keyrod or keyreed should be from .010 - .030". Adjust keyboard rod (Reed) rack support.

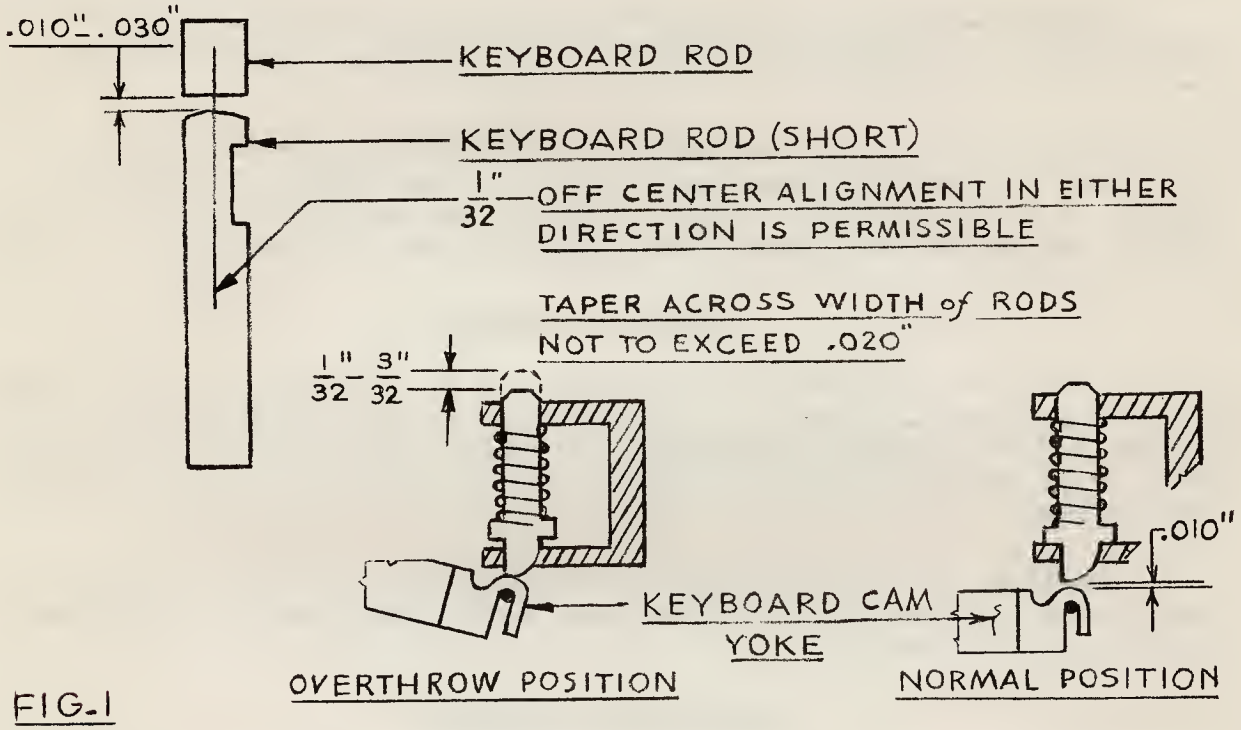


FIG-1

Caution: Do not use carbon tetrachloride to clean either the keyboard buttons or the buttons which operate switches in the keyboard. Carbon tetrachloride will cause the buttons to disintegrate.

(B) Lateral location of magazine to assembler front (Fig. 2)

To make sure that the matrices, when released from the magazine, will drop through the assembler front guides to the assembling channel correctly, it is essential that the magazine channels of each magazine line up properly with the assembly guides.

This adjustment is made by the adjusting screws on each side of the lower end of each magazine frame. These screws should be adjusted so that assembly guide No. 7 will be centered on the "land" between magazine channels Nos. 18 and 19. Each of the four magazine frames should be adjusted laterally to accomplish this result. Note the clearance of .001 to .005" necessary with magazine and frame banked to the right.

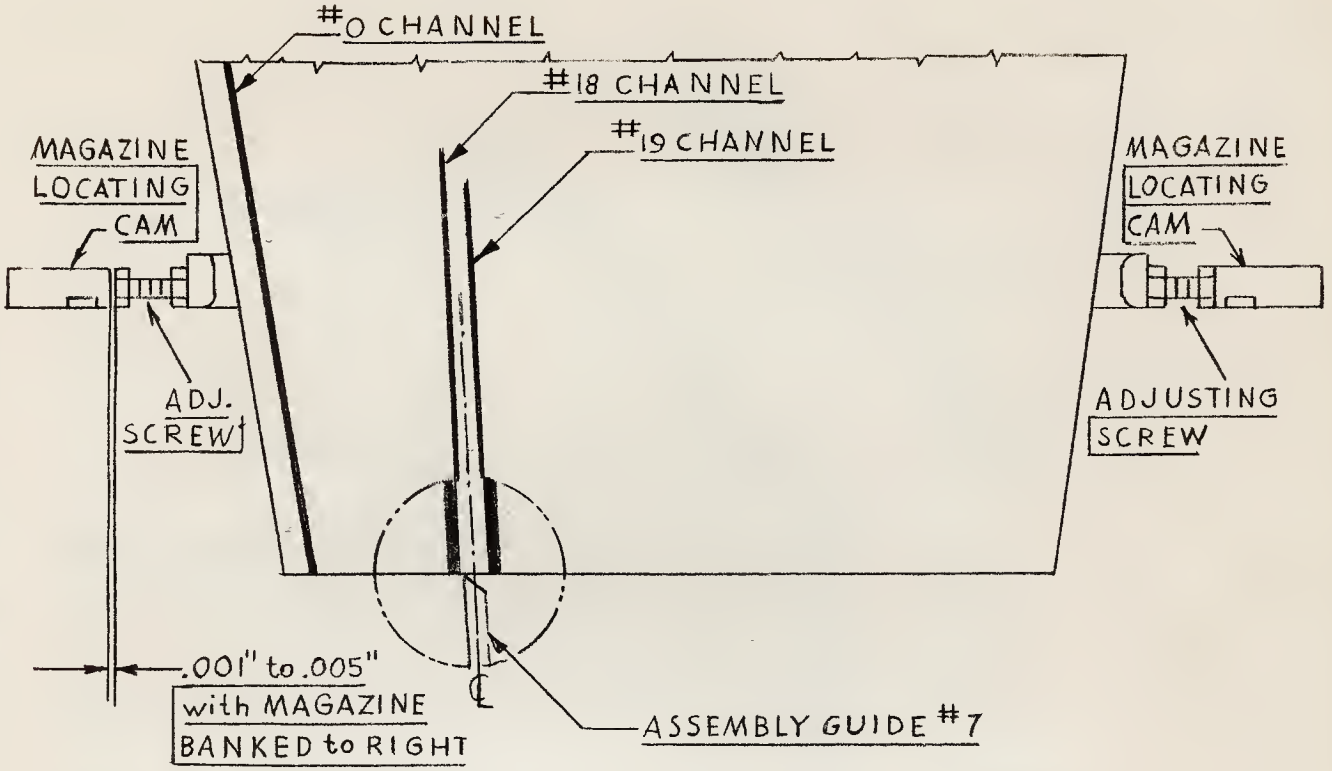


FIG. 2

(C) Assembler Front (Fig. 3)

1. It is essential that there be no impediment no matter how slight, in the travel of the matrices from the magazine to the assembling channel. Any departure from the correct settings for "space" and "drop" at the assembler front will interfere with correct matrix assembly.

2. The drop from the lower plate of the magazine to the assembler front should be between .015" and .030". Adjust magazine frame banking screws, if necessary. These are located underneath the pads at the lower end of each magazine frame.

3. The space between the front of the magazine and the assembler entrance should be from .060" to .075". This space adjustment is made at the factory and normally it should not be necessary to change the adjustment. However, if it becomes necessary, the magazine frame pivot screws at the rear of the magazine are used to make the adjustment.

4. The space between the magazine and the assembler entrance safety flap should be .015" - .030". Reposition buffer on safety flap, if necessary, by loosening fastening screws.

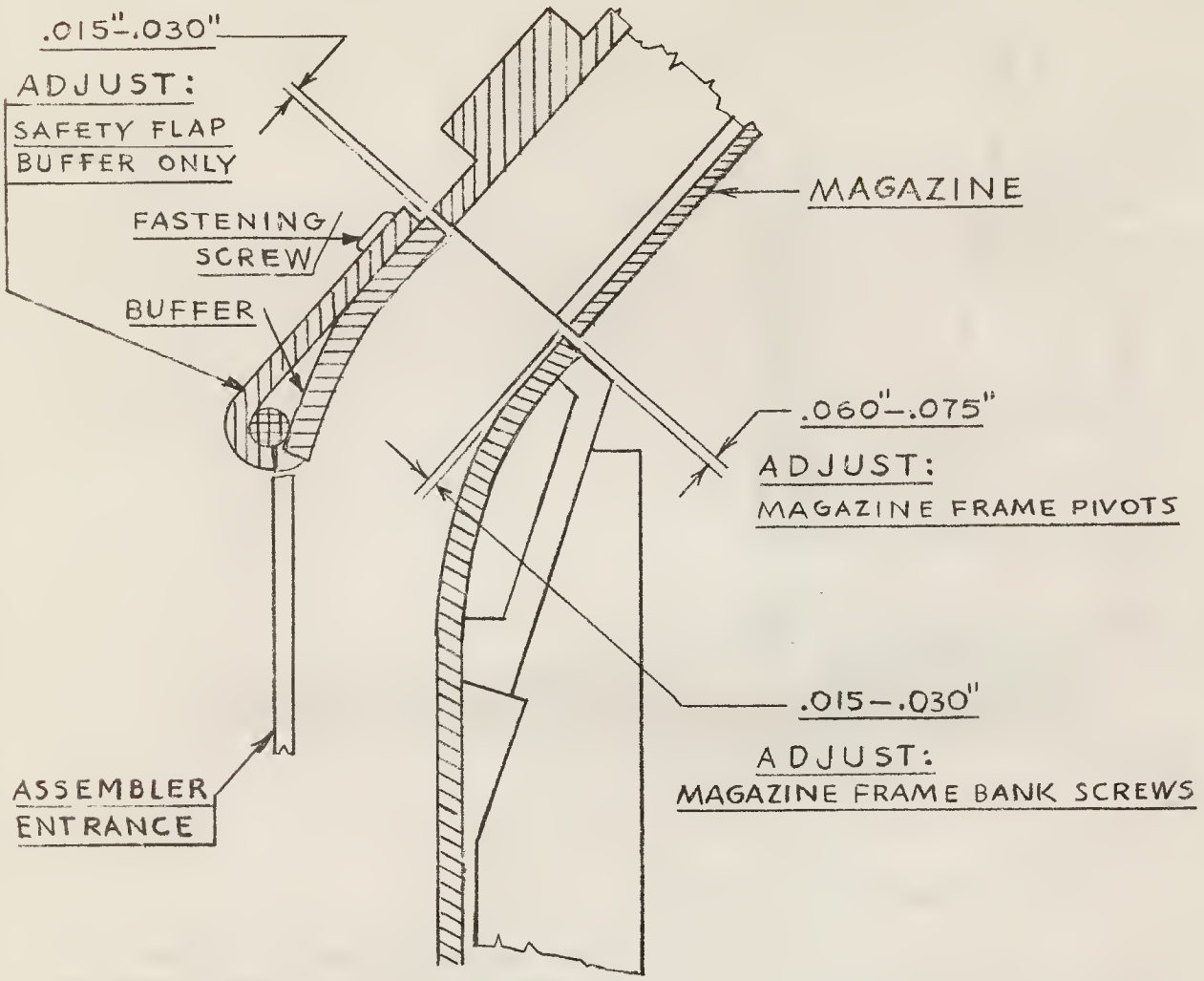


FIG.3

5. The assembler entrance flap latch spring should overlap the latch in normal closed position by .010" to .020". Adjust by means of the jack screw and the lower screw. (Fig. 3A.)

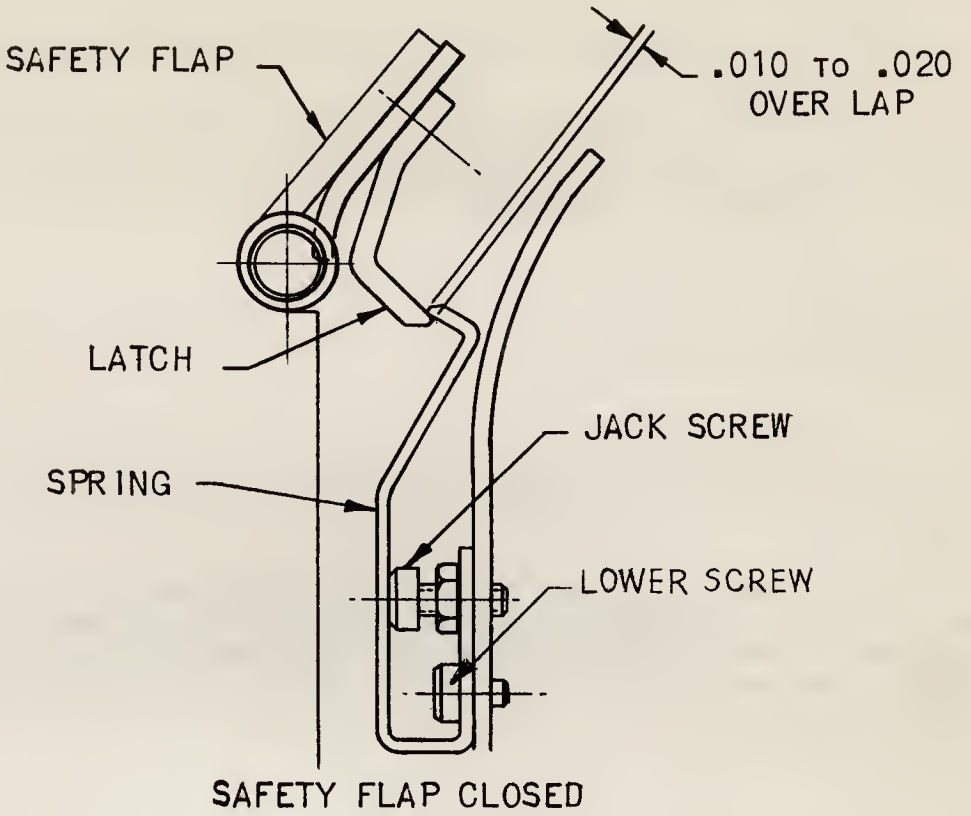


FIG.3A

(D) **Clearance between escapement plunger and escapement lever (Fig. 4)**

This clearance should be from .105" to .125". This adjustment is made by means of the keyreed rack banking screw in back of Reed Frame.

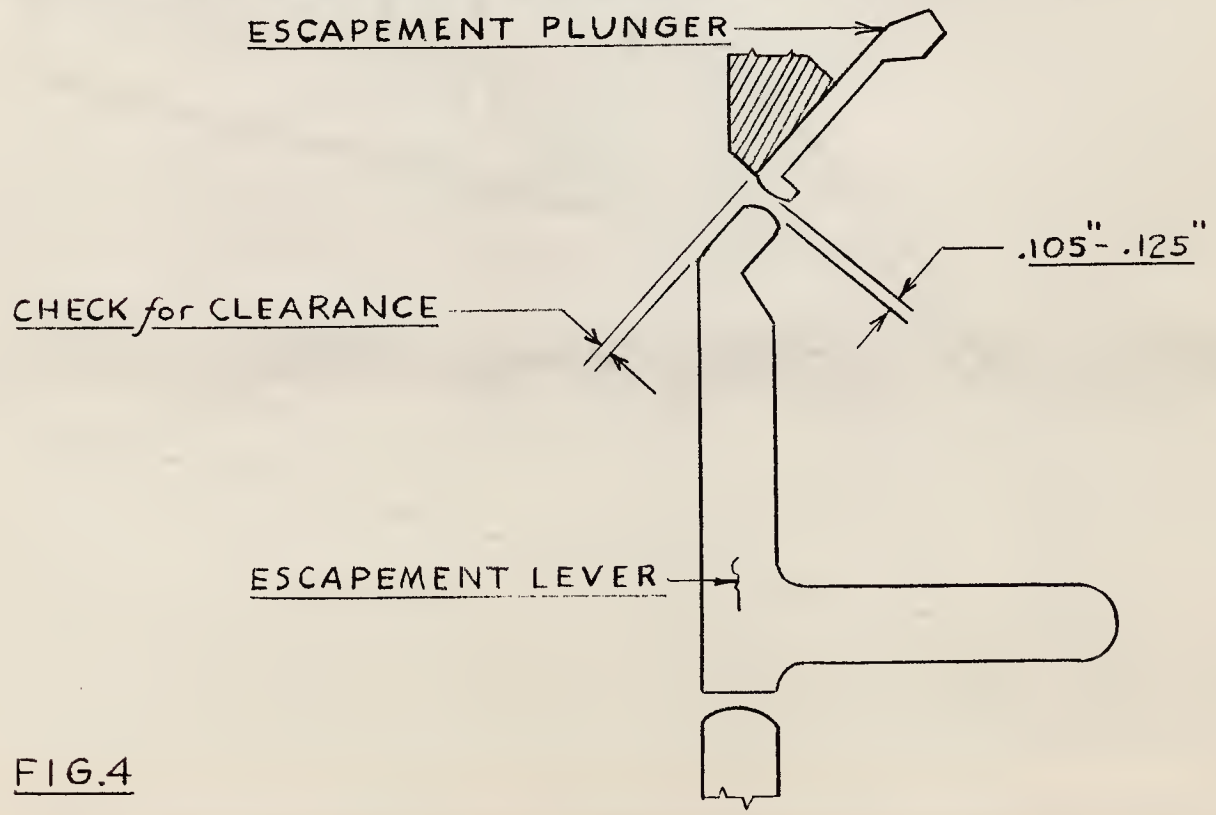


FIG.4

(E) Relationship of assembling guides to matrix delivery belt (Fig. 5)

The assembling guides are formed to their correct contour at the factory, for best assembly of matrices. In some cases, however, the lower end of the assembling guides may have become bent or out of correct position with respect to the matrix delivery belt.

The lower end of the assembling guides should normally be approximately 3/8" from the matrix delivery belt. If necessary, the lower end of the guides should be formed to allow the maximum width matrices used to turn freely on the matrix delivery belt.

Under no circumstances should any attempt be made to bend the upper ends of the assembling guides, since these guides are fixed to the assembler front, by a projection at their upper ends which fits into a slot in the assembler front.

At the rear of this service instruction there is a paper template showing the way the assembling guides are set in the factory. This template can be cut as instructed and placed under the lower portion of the guides so that the shape of the lower end of the guides can be compared with the correct factory setting.

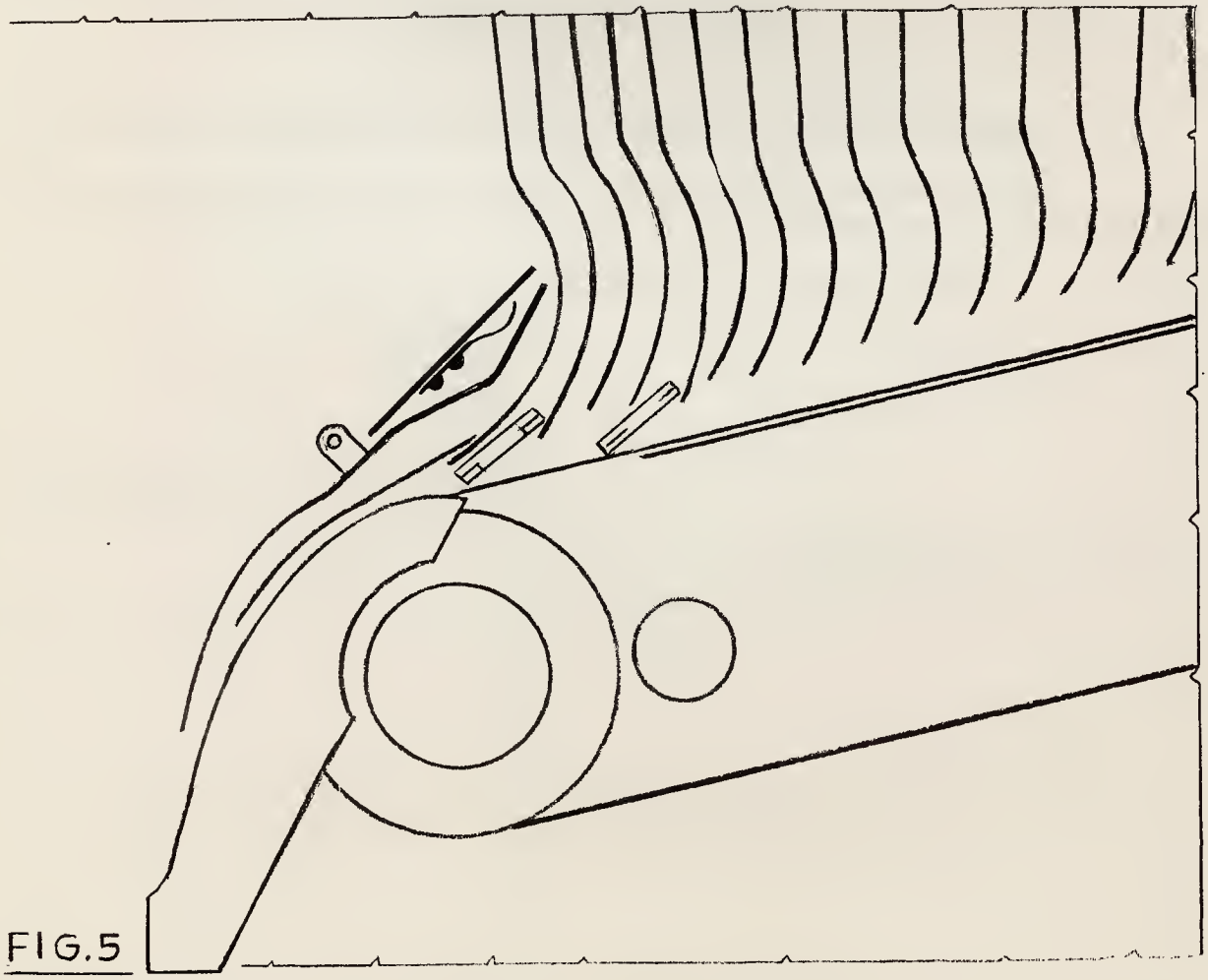


FIG.5

* (F) Assembler Chute Finger (Fig. 6)

1. The flexible leaf on the No. 1 assembler entrance guide should be adjusted to clear the thinnest matrix used.

2. The assembler chute finger should be adjusted to just clear the thickest matrix in font. Use adjusting nut "A" to make the adjustment.

3. The MS 12 Assembler Chute Finger Switch should be adjusted by screw "B", so that when the assembler chute finger is set correctly as outlined in (2), MS 12 switch should just be actuated.

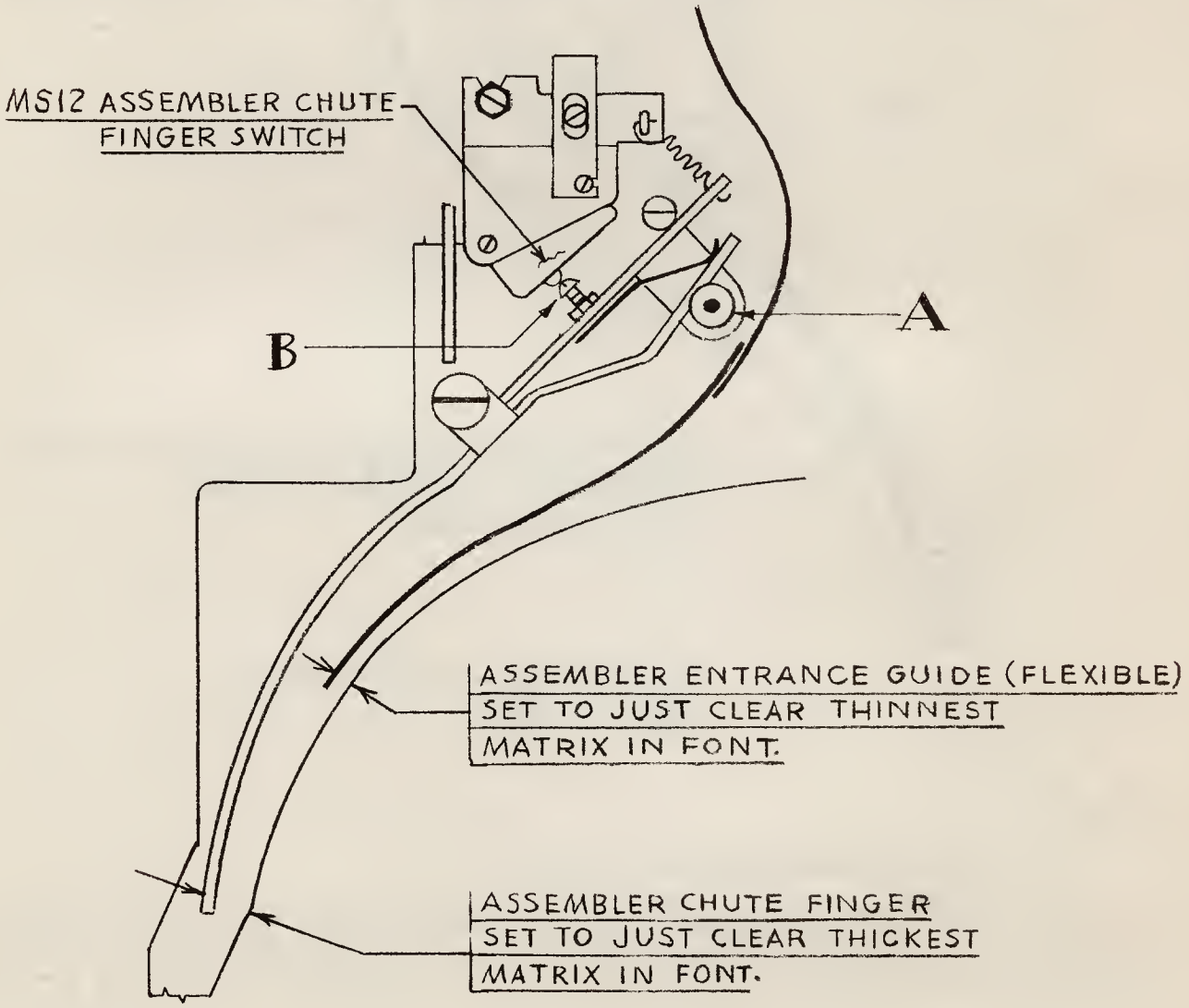


FIG. 6

* (FF) Assembler Chute Finger (Universal) (Fig. 6A)

On those Elektrons equipped with the Universal Assembler Chute Finger, the finger should be adjusted so that there is 1/4" between the

lower end of the finger and assembler chute rails. With the finger set to 1/4", the finger will accommodate any thickness of matrices which will run in the standard 90-channel magazine.

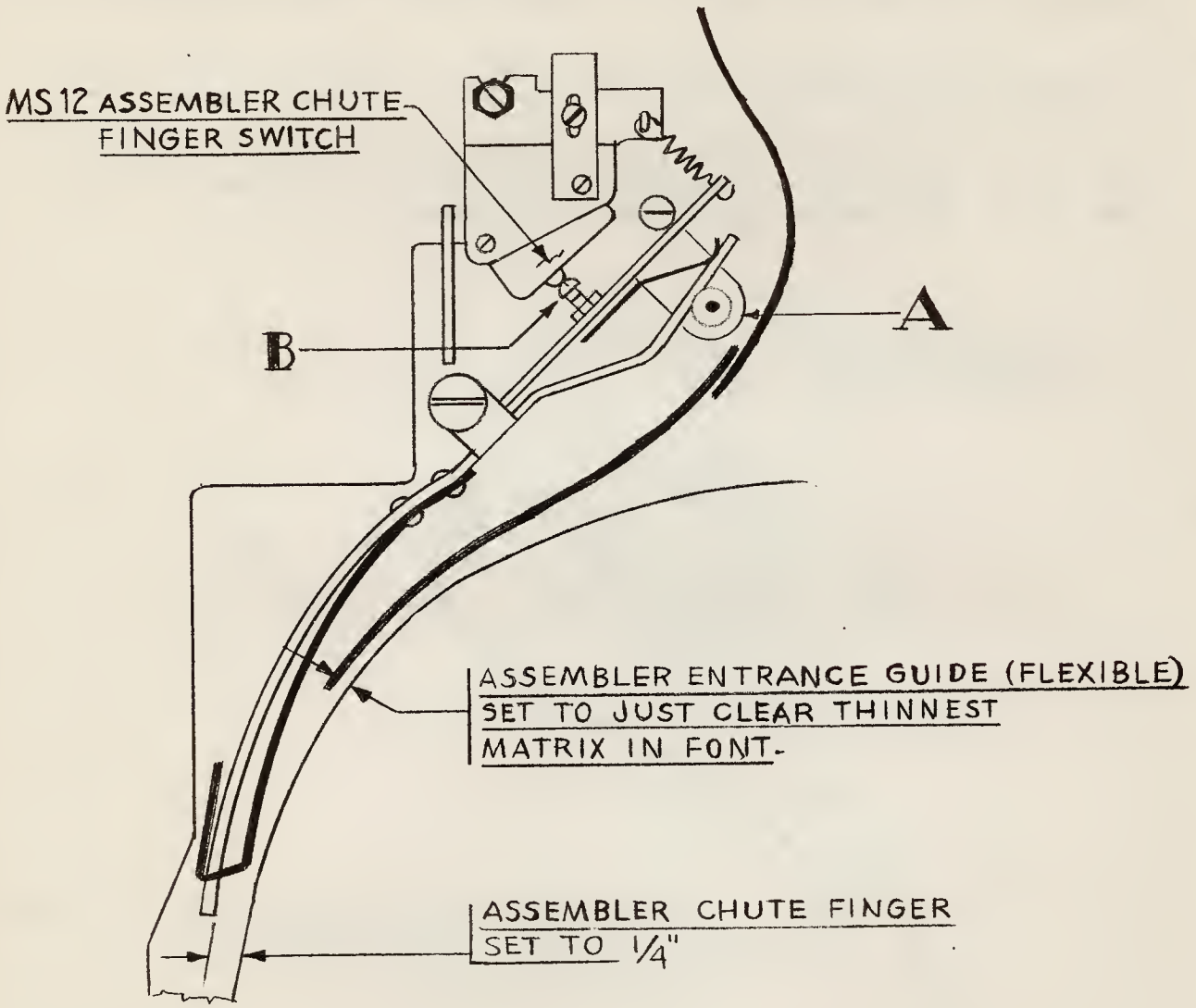


FIG. 6A

* (G) Assembler Star Friction (Fig. 7)

The friction adjustment for the assembler star should be set slightly greater than on other model Linotypes. An approximate setting can be obtained by turning the slotted nut (1) inward all the way and then back off one complete turn.

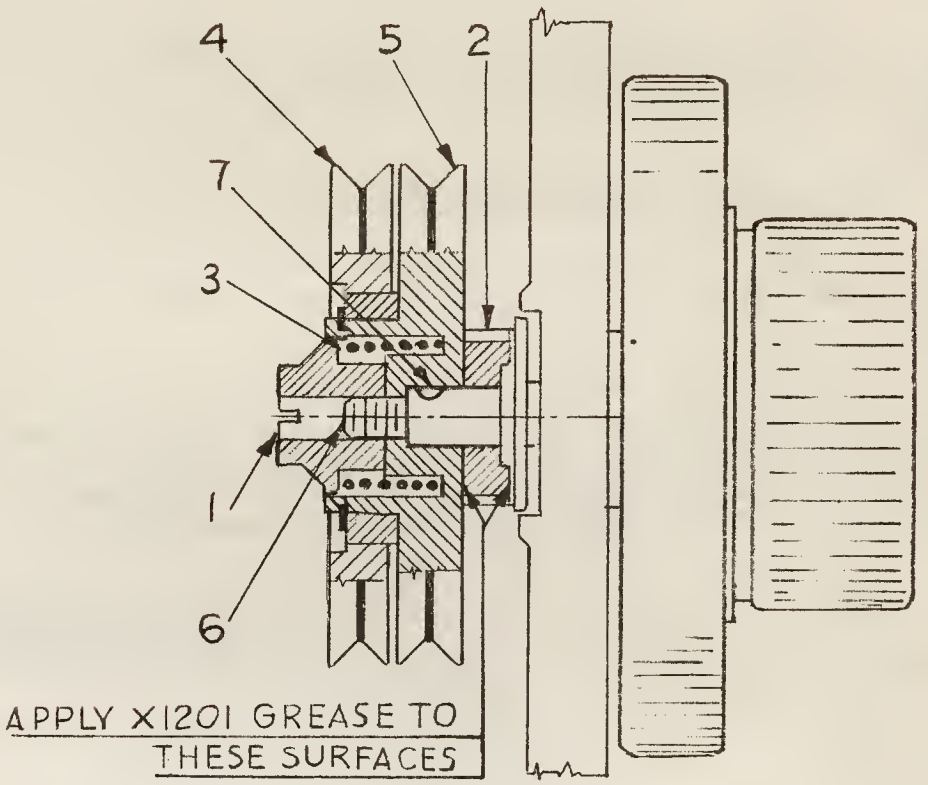


FIG. 7

To make sure that the assembler star friction is not set too strong which will result in excessive wear of the star and the toothed driving belt, stop the assembler and then swing out the assembler front. Hold the assembler star to prevent it rotating and then turn the hand wheel. The friction disk (2) and the toothed belt should not rotate if the assembler star friction is correct.

If the friction disk or sprocket (2) rotates and the toothed belt slips on the assembler star sprocket being held, then the friction is set too tight and the teeth will tear off the toothed belt.

It is recommended that a small amount of X-1201 Linotype grease be applied periodically to friction disk (2) to prevent siezing. To apply grease to this disk which is also the assembler star driving sprocket, first unscrew adjusting nut (1) and remove spring (3). Then take off the assembler belt pulley (5) and the idler pulley (4). These two pulleys are held together by a retaining ring.

Pulley (5) is keyed to shaft (6) by a small key (7). Before removing the two pulley assembly, a cloth should be held underneath to catch the small key (7), if it is facing downward and is slightly loose.

Key (7) must then be removed if it remains in the shaft and then the disk (2) can be removed, and a small amount of Linotype grease should be applied to both sides of the disk. Two holes are in the disk to retain the grease.

(H) Duplex or Lateral Rail (Fig. 7a)

This rail should be adjusted so that in its actuated position, the hook in the end of the rail is .004" to .008" from the assembler chute front rail.

To adjust, loosen the two screws (4) and shift plate (5) to the position required so that when lever (1) contacts the projection (2) of the duplex rail and moves it to the right when the duplex rail solenoid L-19 is energized, the duplex rail will bank against the left side of plate (5) and stop within .004" to .008" of the assembler chute front rail.

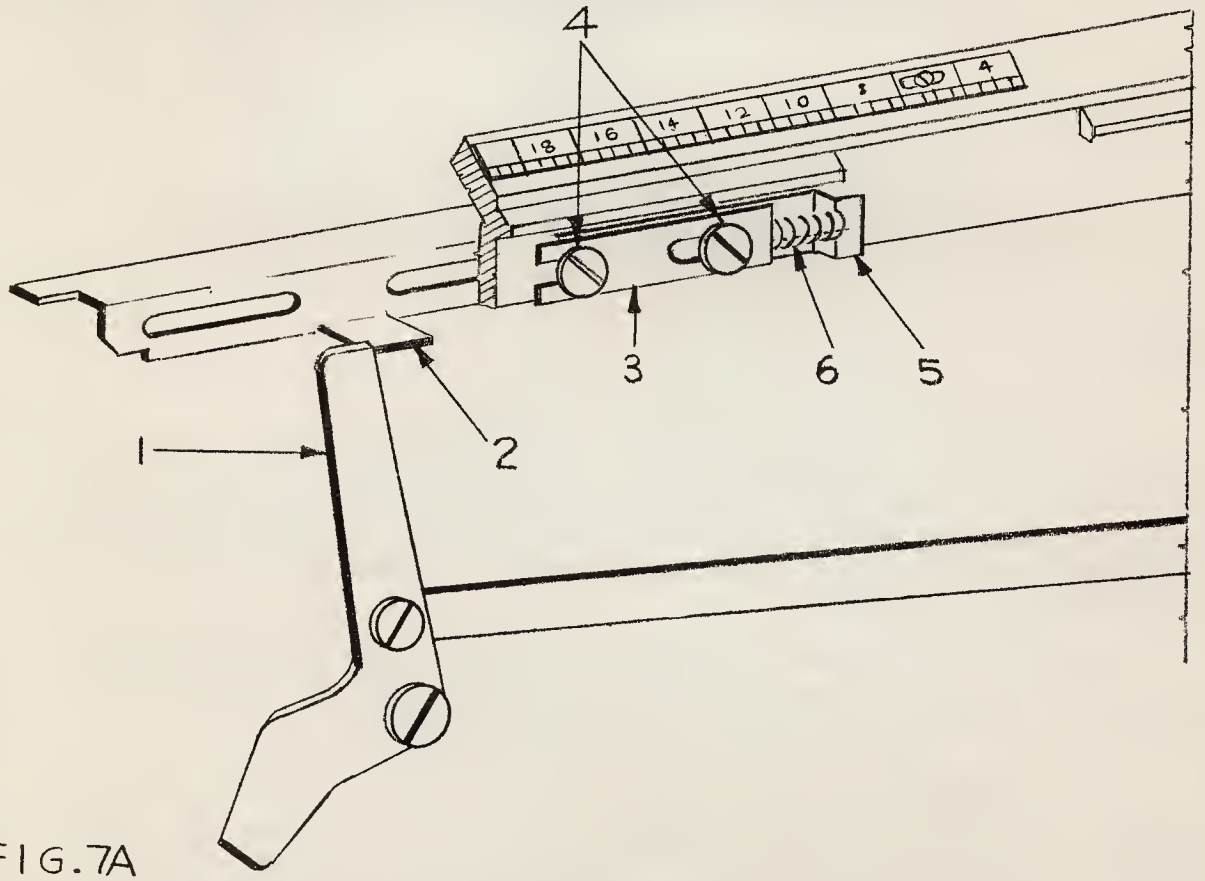


FIG.7A

(I) Setting of Assembler Star (Fig. 8)

* 1. Normal Position of Assembler Star

Adjust eccentric (9) so that in normal position (Star Wheel Pusher Solenoid (8) not energized), the assembler star extends .020-.030" beyond assembling channel front and back pawls. This is a factory setting which normally should not change.

The toothed assembler star driving belt (17) should be adjusted for proper tension by eccentric bushing (16) in the idler pulley (15), when the assembler star is in normal position. When the belt is adjusted properly, it should have a small amount of slack. If the belt is too tight, the assembler star slide will not operate correctly.

* 2. "Push" position of assembler star

Adjust stop screw (10) so that in the "push" position of the assembler star, the star is 3/32-1/8" beyond the assembling channel front and back pawls. This is necessary to permit spacebands to assemble correctly and to provide room for the No. 2 and 3 fingers when they pivot down behind the last matrix in an assembled line, for delivery of the line.

3. Checking normal position of assembler star

The normal position setting of the assembler star should be checked once a week due to star wheel wear. Adjust eccentric (13) to retain the normal position setting so that the star will be .020 - .030" beyond the front and back pawls. If this adjustment cannot be made because of assembler star wear, the star must be discarded.

4. Cleaning Assembler Star and Matrix Delivery Belt

These should be cleaned with a cloth dampened with "Typewash" every 1000 lines to remove any foreign matter so that the star and the belt will retain their friction qualities.

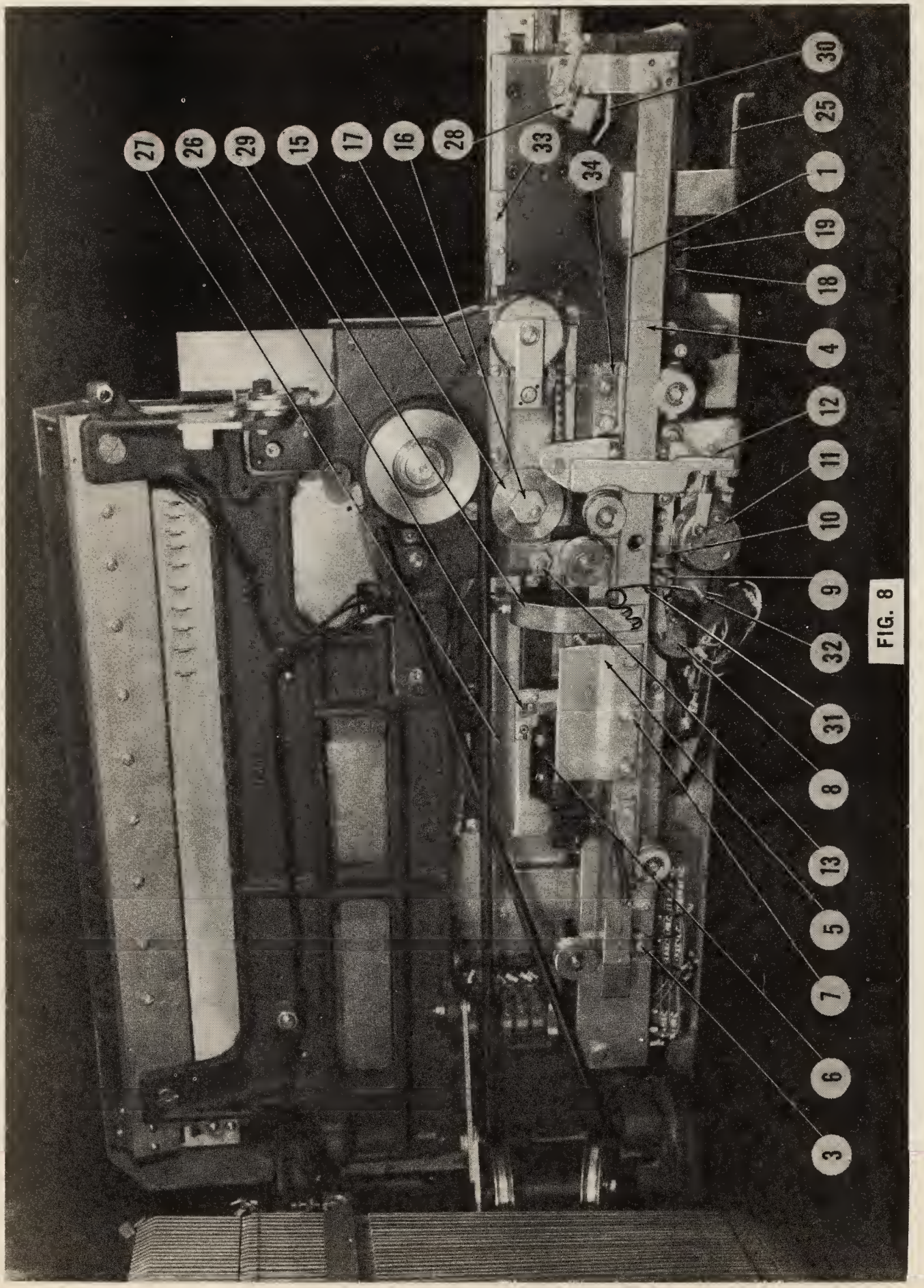


FIG. 8

(J) Adjustment of the Swinging Assembler Front

1. Horizontal Adjustment (Fig. 9)

The back rail of the assembling channel, which is at the left hand lower end of the swinging front, must align with the corresponding surface of the delivery channel within plus or minus .005".

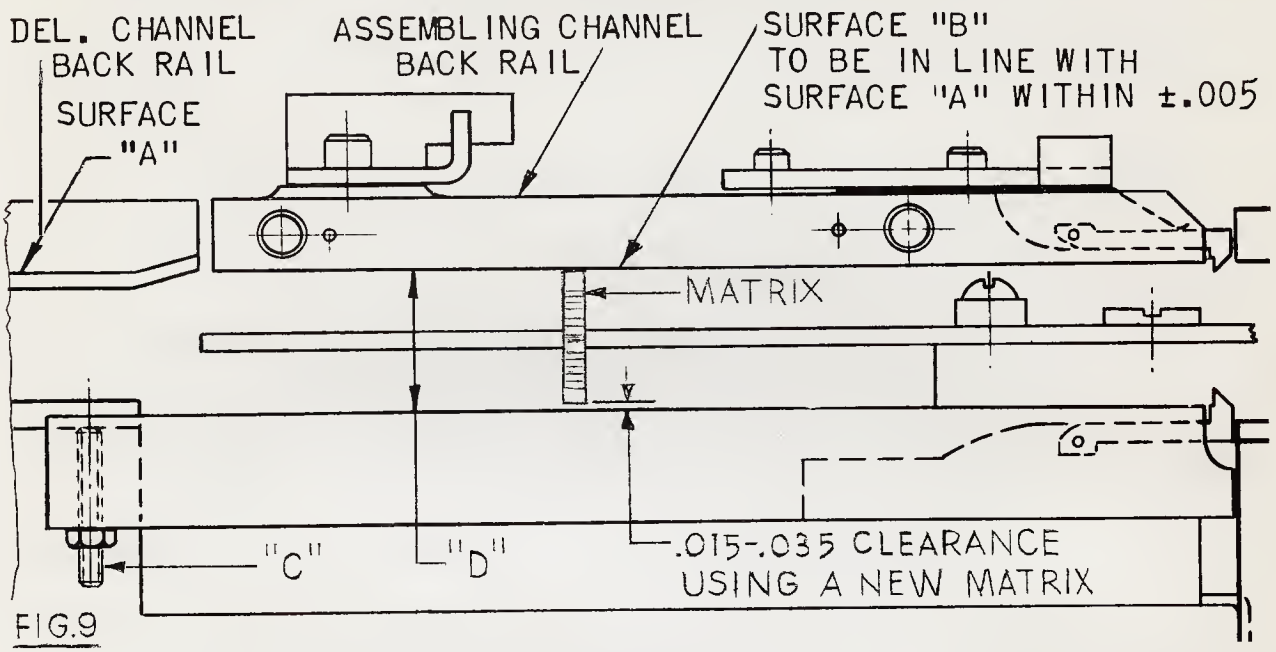


FIG.9

There are two screws used for the "in" and "out" adjustment of the swinging front. The upper screw is in the swinging front as shown at (C), Fig. 10. The lower screw is in the right hand end of the face plate assembly, just to the right of the No. 3 finger hub, when this finger is in normal position.

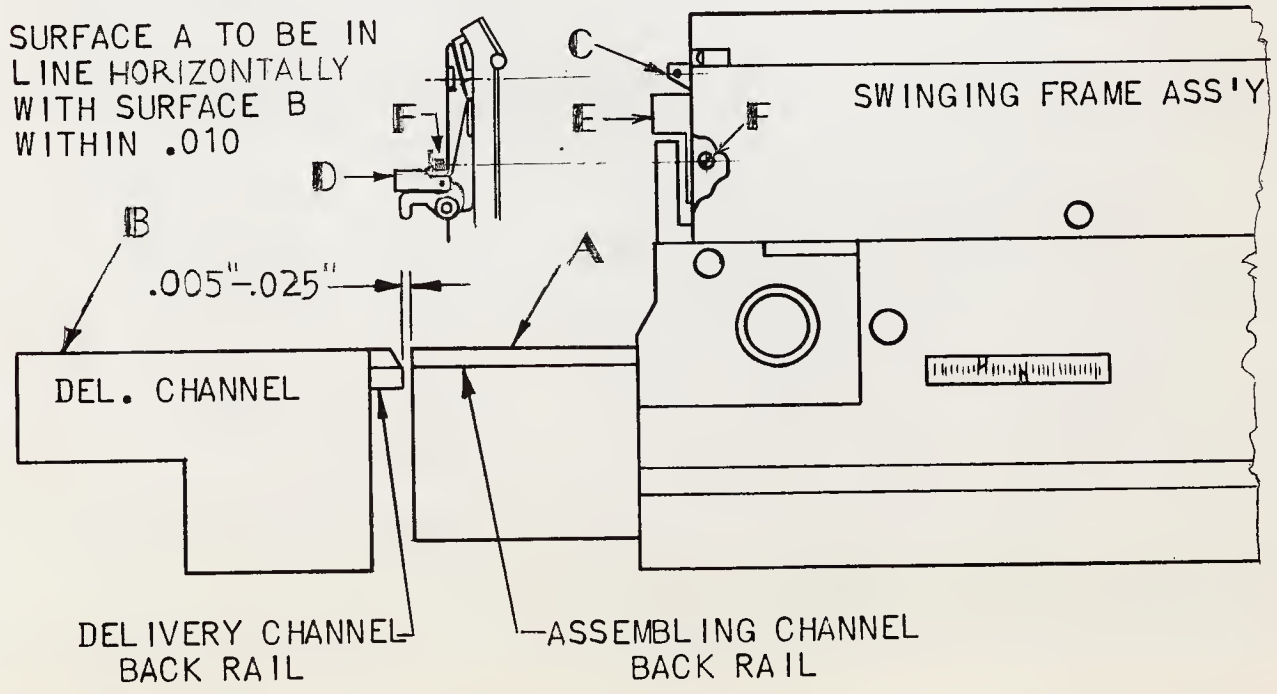


FIG.10

2. Vertical Adjustment (Fig. 10)

The up and down adjustment of the left end of the swinging front is made by an adjusting screw located just above the left side of the MS 12 Assembler Chute Finger Switch. Turning the screw raises or lowers latch (D), which when the swinging front is closed, rests on an eccentric stud located in the right-hand upper section of the face plate casting. Surface (A) of the assembling channel should be in line with surface (B) of the delivery channel so that a line of matrices and spacebands will pass freely from the assembling channel into the delivery channel.

The eccentric stud is first adjusted so that the locking latch (E), locks the swinging front tight against its two banking screws.

The up and down adjustment should then be made, using the adjusting screw (F) located just above the MS 12 switch to raise or lower latch (D).

3. Clearance between assembling channel and delivery channel (Fig. 10)

This clearance should be .005" to .025" and is set at the factory by adjusting the bracket on which the swinging frame hinges. This bracket is doweled at the factory and the clearance specified should not change.

4. Distance between inside of assembling channel gate and assembling channel back rail

This distance (D) should be .015" - .035" greater than the width across the ears of a new matrix (.750"). Adjust by screw (C), Fig. 9.

* (K) Assembling Channel Pawls

The front and back pawl springs should be adjusted to have as light a tension as possible, to retain the pawl against its bank, in normal position.

(L) Assembler Chute Cover

This cover must bank against the assembler chute, when the cover is in the closed position.

(M) Spaceband Buffer Finger

This finger (18), Fig. 8, should be adjusted by loosening screw (19), and turning the eccentric so that the surface on which the spacebands rest, is parallel with the top of the assembling channel rails.

(N) Line Measuring Assembly (Fig. 8)

1. Long Line Switch (6) (MS 23) should be approximately parallel to the two slides (1) and (4). Adjust if necessary by eccentric (3).

2. Switch (6) should have 1/32 - 3/32" overtravel, when actuated by cam (5). Adjustment is made when the switch roller is on the cam (5), by moving the switch on its mounting.

For adjustment of switch (6), it is advisable to open the assembler front cover, lower. This will expose the two socket head screws holding switch (6) so that they can be loosened to make the adjustment.

To open the assembler front cover, lower, first open the assembler cover, then unscrew the assembler stop knob. Then, open the assembler front upper cover, remove the two socket head screws holding the assembler front cover, lower, and drop the cover down.

When pivoting the cover back into place, make sure that the restraining cover chain at the right side is folded out of the way of the indicator light switches.

* 3. Line Measuring Slide Brake (Fig. 8)

In normal position, the brake shoes must contact the line measuring slide, to create a drag on this slide for proper matrix assembly.

To obtain this condition, adjust nuts on link (12) so that the link is free. When solenoid (11) is energized, the brake shoes must not restrict the return of the slide.

The slide and brake shoes should be cleaned daily with "Type-wash" to make sure that the brake will operate correctly.

4. Adjustment of cam (5) to actuate long line switch (6)(MS 23) if the line is too long (Fig. 8)

Set the L.H. Vise Jaw for 12 ems and place a 12 em block and a .028" thin space in the assembling channel. Turn the assembler star so that the prong next to the thin space is horizontal. A new assembler star should be used.

Adjust cam (5) by turning eccentric (7) so that switch (6) is just actuated. When cam (5) has been set correctly, the long line lamp (I5) will light if the assembled line is overset by .028".

5. Adjustment of Line Measuring Assembly (Fig. 8)

If it becomes necessary to completely reset the adjustment of the Line Measuring Assembly, proceed as follows:

(a) Make sure the assembler star settings are correct for the normal and push positions, as explained under I-1 and -2. Then adjust eccentric (3) so that switch (6) (MS 23) is parallel to slides (1) and (4).

(b) Set Left Hand Vise Jaw Control to 12 ems.

(c) Close swinging frame and engage arm (25), in slot of the block of L.H. Vise Jaw Control. Using the knurled nut at the right of block, adjust slide (1) until pointer (26) on scale (27) reads 12 ems.

(d) Adjust switch (6) on its mounting so that the switch is actuated with an overtravel of from 1/32" to 3/32". See N-2.

(e) Engage latch (28) on slide (4) with catch or extension, which is fastened to bottom of the No. 1 Finger Bearing.

(f) Place a 12 em block and a .028" thin space in the assembling channel and release the brake which holds slide (4) so that the No. 1 finger will hold the 12 em block and the thin space against the assembler star.

(g) Position cam (5) using eccentric (7) so that switch (6) is just actuated.

(h) Close swinging front. The long line lamp should be lighted. If not, adjust the knurled nut in the L.H. Vise Jaw Control until it just lights. If lamp is lighted when swinging frame is closed, adjust knurled nut to make light go off and then adjust nut to just light the lamp. The use of the knurled nut is the fine adjustment.

(i) Check pointer (26) on scale (27) and reset if it does not read 12 ems.

(j) Remove the .028" thin space from the assembling channel and set pointer (29) to read 12 ems when the No. 1 finger is against the 12 em block.

* (O) No. 1 Finger (Fig. 16)

This finger (21) acts not only as an assembler slide (line measuring slide) finger when the line is being assembled, but also as a delivery slide finger when the line is being delivered to the first elevator jaw.

In order that the matrices assemble against this finger properly, it must have the correct restraining action or tension.

1. The No. 1 finger should always be square with the matrices.

* 2. This finger should have a tension of approximately 1-1/2 pounds when the swinging front is open, and 2 pounds when the swinging front is closed with the line measuring slide connected to the No. 1 Finger.

* 3. Adjust by turning knurled knob on No. 1 Finger return spring drum.

* (P) No. 3 Finger (Fig. 11)

After the No. 2 and 3 fingers drop down behind the last matrix in the line, the line is delivered and held between the No. 1 and No. 2 Fingers. The matrices for the next line then assemble against the No. 3 finger until such time as the No. 1 finger returns.

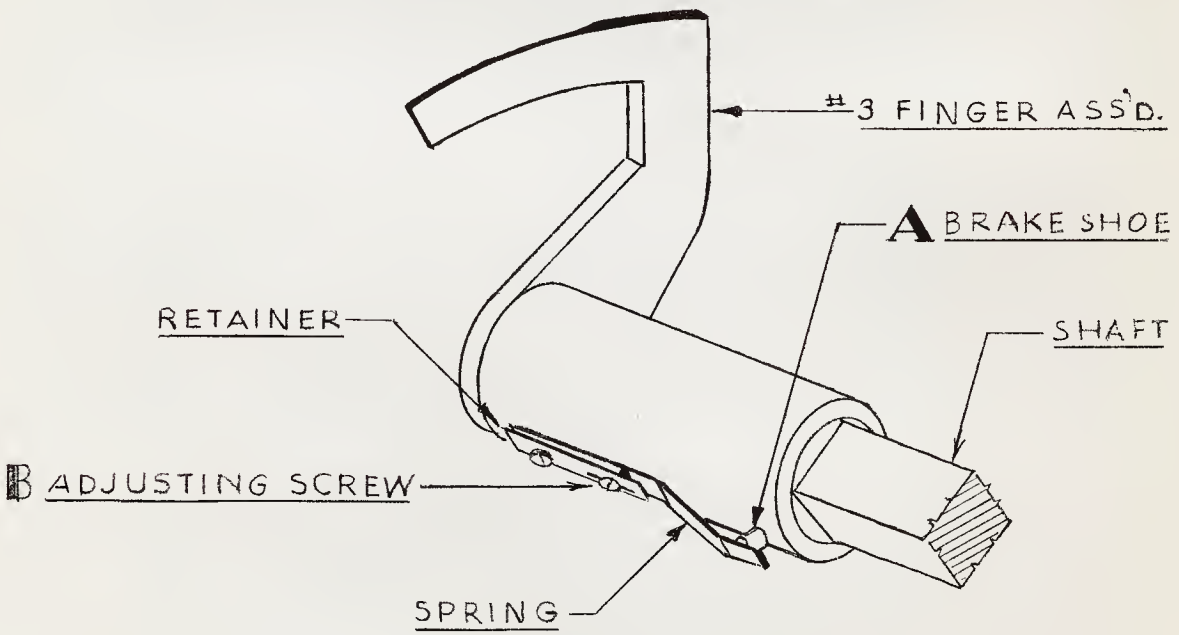


FIG.11

(Q) Release of Spacebands from Spaceband Box (Fig. 12)

1. The height of the spaceband pawls (A) should be set so that each pawl is 1/32 - 1/16" below the spaceband rails (B). This will insure the pawls lifting the spaceband over the rails so that it can drop into place in the assembled line.

This adjustment is obtained by moving the bracket to which the spaceband release solenoid L-101 is fastened, up or down. This bracket

has slotted holes for this purpose. On Elektrons which are equipped with the Spaceband Lockout Lever, as shown at (22), Fig. 17, this adjustment is a permanent setting made at the factory.

2. The spaceband pawl (A) should be adjusted laterally so that it is .020 - .030" inside of the spaceband rail (B). This is to insure that the pawl will contact the bottom of the ear of the spaceband slide to raise the spaceband over the spaceband rails.

Adjust the .020" - .030" dimension by loosening the two screws (C) and moving the spaceband pawl laterally with respect to lever (D).

3. Adjustment of spaceband box center bar (G) and cam (F).

The center bar (G) can be moved laterally by loosening screw (E). Fastened to the center bar is a cam (F). This part cams the ears of spaceband off the spaceband pawls and over the projection on the spaceband rails.

The center bar (G) should be positioned so that its right hand end is .003 to .005" from touching the spaceband chute hinge plate.

The cam (F) should be positioned so that it will permit only one spaceband over the spaceband rail projections without binding.

4. Spaceband Detaining Plate.

Position the spaceband detaining plate (H) by means of screw (I) so that the bottom of the spaceband wedge will clear the detaining plate by .025".

Check to see that the lower end of a spaceband has 1/32" bite or engagement with the detaining plate, with the spaceband in unreleased position.

5. Adjustment of Intermediate Channel and Spaceband Box.

(a) This box should be adjusted in and out, so that it will align properly with the first elevator jaw when this jaw is at transfer position. Use the adjusting bushings which are located under the two fastening screws.

(b) The right hand side of the box should be parallel to the face plate on to which it is fastened, and the spaceband box chute centered to the assembling channel. If necessary to adjust, use the two adjusting screws located in back of the right-hand end of the box.

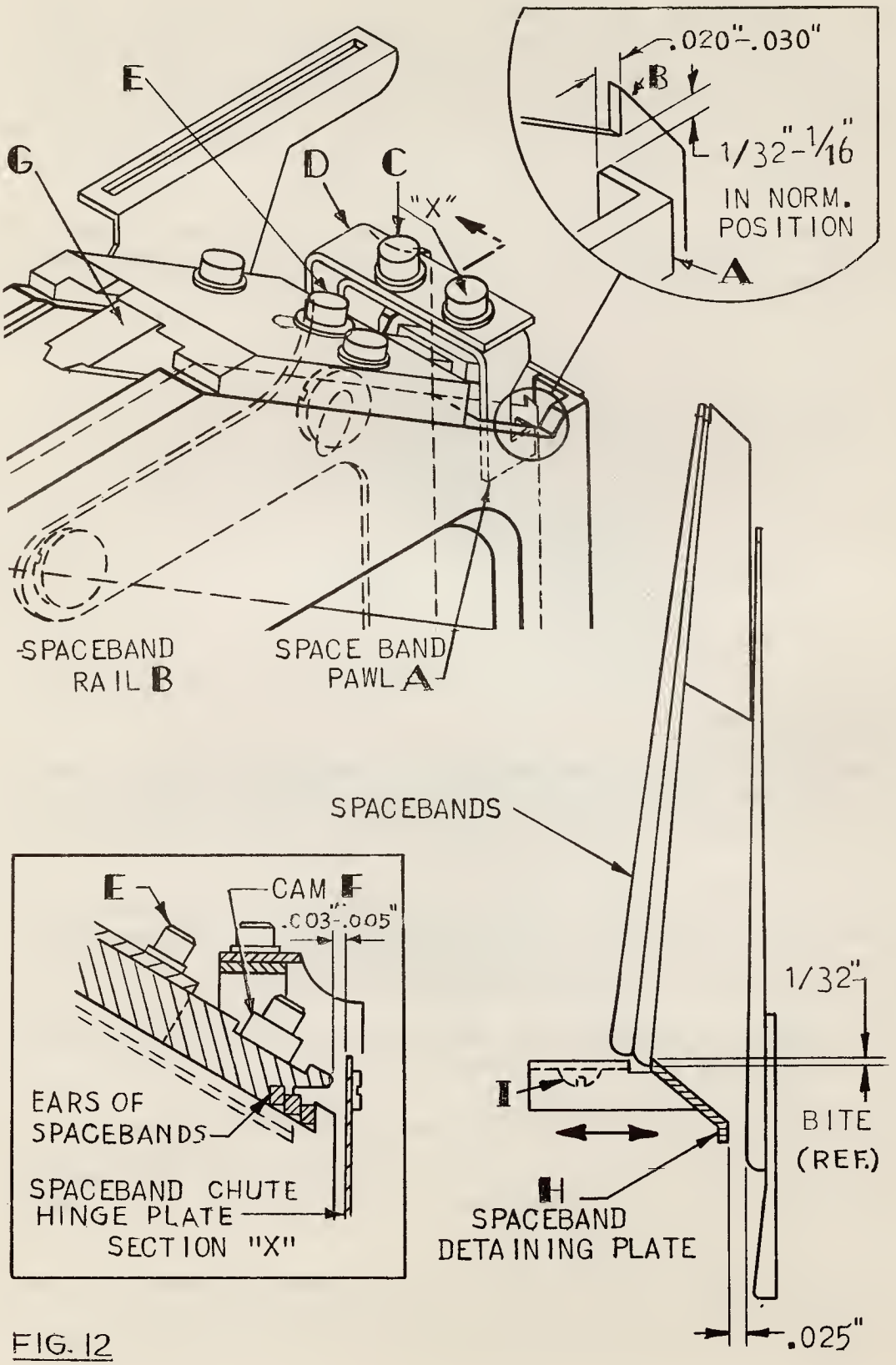

.020"-.030"
B
1/32"-1/16"
IN NORM. POSITION
A
E
G
D
C
"X"
SPACEBAND RAIL B
SPACE BAND PAWL A
SPACEBANDS
E
CAM F
.003"-.005"
EARS OF SPACEBANDS
SPACEBAND CHUTE HINGE PLATE
SECTION "X"
1/32"
I
BITE (REF.)
H
SPACEBAND DETAINING PLATE
.025"

FIG. 12

(R) Spaceband Reed Switch S-101 (Fig. 13)

When the spaceband reed reaches its highest position due to action of the keyboard spaceband cam, spaceband reed switch should be closed. Closing of this switch energizes the spaceband release solenoid (L-101) to release a spaceband and also energizes the L.H. Latch Solenoid L-22 on the Timer in the Power Central so that the star wheel pusher solenoid L-10 will be energized to push the star wheel ahead so that the spaceband can drop behind the last matrix in the line being assembled, without interference.

Adjust screw (A), located in the angle bracket attached to the spaceband reed (B) so that switch S-101 will not close until the reed is 1/64-1/32" from its maximum height.

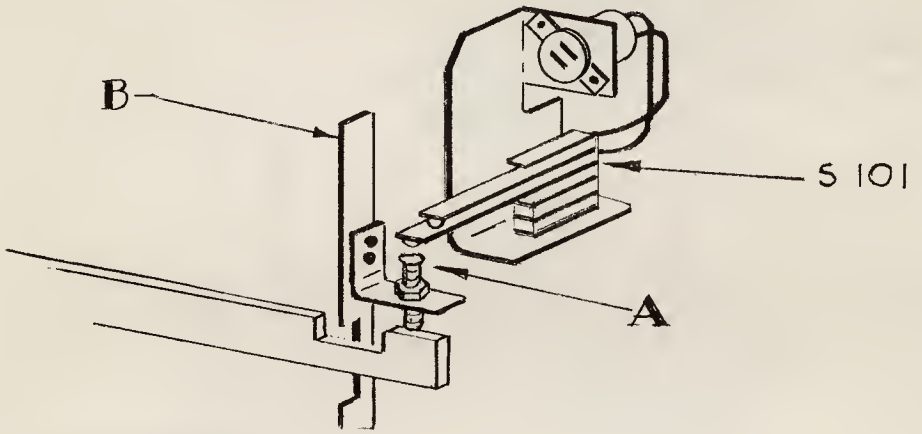


FIG.13

(S) Spaceband Timer

Advancing or retarding the release of a spaceband, so that it will drop properly behind the last matrix of each word, in the line being assembled, is accomplished by setting the Spaceband Timer which is located underneath the keyboard.

For maximum delay of the release of a spaceband, the toggle switch in the Spaceband Timer should be set to its high position and the adjusting screw turned as far as it will go, in a clockwise direction. To obtain less delay, turn adjusting screw in a counter-clockwise direction.

If less delay is required, set the toggle switch to its "low" position and turn the adjusting screw, as required.

(T) Line Measuring Slide (Assembler Slide) Inhibitor (Fig. 14)

The inhibitor consists of a square latch which pivots on an adjustable plate (5), fastened to the assembler slide (1). Its purpose is to inhibit or prevent the effect of a false tight line.

The small roll (2) in the inhibitor latch strikes the end of the slide (4) when the assembled line is full. This forces the latch downward and stretches spring (3) which exerts a force to hold the line of matrices against the assembler star.

The No. 1 finger has its own spring tension but the inhibitor exerts an additional tension to help keep the line of matrices against the assembler star.

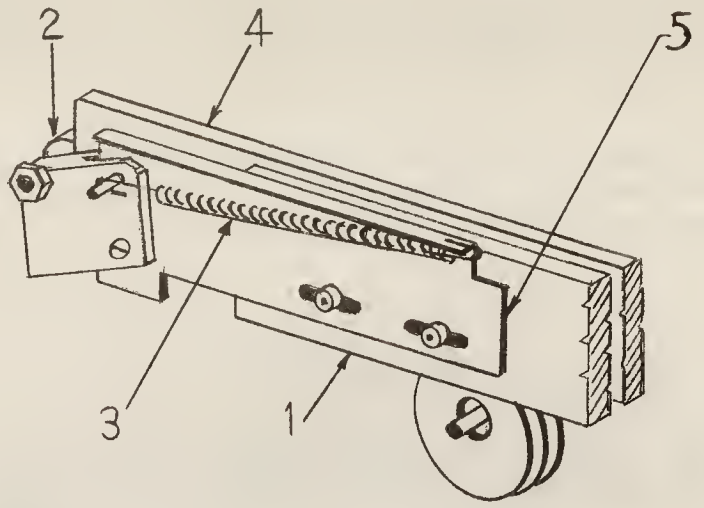


FIG.14

The inhibitor is particularly useful to reduce the effects of a false tight line. For instance, if at the end of the assembled line there is a spaceband and single character, the No. 1 finger may jump ahead and although the Assembly Mode Control will release the assembler slide finger brake, so that the slide can move back to the right, there may not be enough No. 1 finger tension to move the matrices against the assembler star and the tension of the inhibitor helps to move the matrices against the assembler star to eliminate the false tight line.

To adjust the inhibitor, position the adjusting plate (5), so that when roll (2) touches the end of slide (4), a 1/32" additional movement of slide (1) will cause the tight line lamp to go on.

(U) Adjustment of Switches used in the Assembly of Matrices

There are five switches involved in the assembly of matrices. These are:

Upper Rail Switch - MS 41
Lower Rail Switch - MS 31
Long Line Switch - MS 23
Manual Finger Brake Switch - MS 13
Spaceband Reed Switch - S-101

The upper and lower rail switches MS 41 and MS 31 in the keyboard do not require adjustment. The adjustment for long line switch MS 23 is given under section "N", page 14, while that of the spaceband reed switch S-101 is given under section "R", page 20.

Manual Finger Brake Switch MS 13 (Fig. 15)

Switch MS 13 is held in actuated position by the manual brake release lever (1). When the right hand side of this lever is depressed, the actuating button of the MS 13 switch is released. This completes the 24 volt circuit to the Finger Brake Solenoid L-23 to energize it, which releases the brake.

Stop screw (2) should be adjusted so that the left hand end of the lever (1), just actuates the switch MS 13. If necessary, the switch can be pivoted on its mounting bracket.

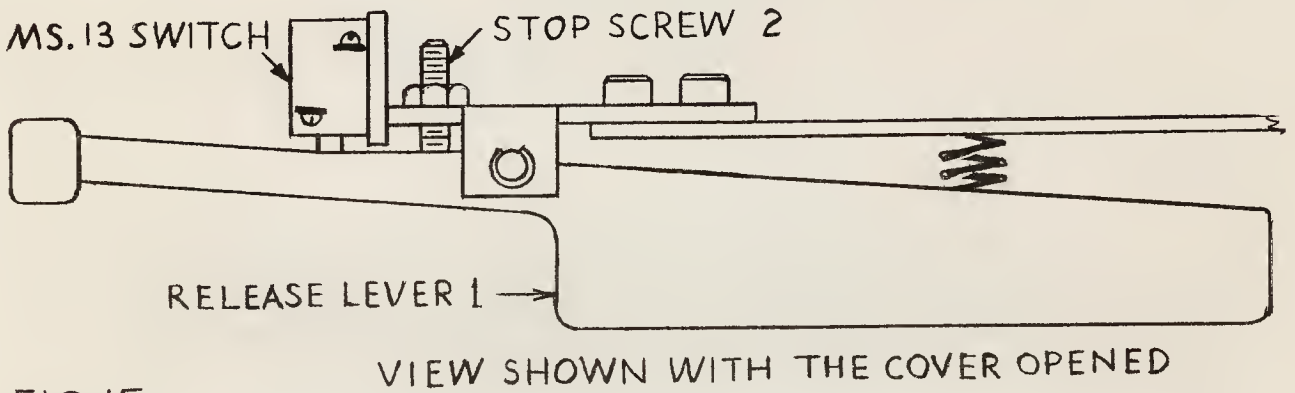


FIG. 15

DELIVERY OF THE ASSEMBLED LINE

Description of the Delivery of the Line (Figs. 16 and 17)

When the line of matrices has been assembled, delivery of the line is initiated by the delivery switch in the operating unit, or, if the Elektron is manually operated, by the delivery switch MS 21 or MS 22 on the keyboard. The cam shaft of the Delivery Timer then starts to rotate and when Timer Switch TS 7 is closed, the Delivery Release Solenoid L-11 will be energized, to release the delivery slide.

Figure 16 shows the delivery release mechanism in normal position before the line is delivered to the first elevator jaw. Lever (3), collar (4) and levers (5) and (6) are all pinned to shaft (7). Lever (6) which is the relatching lever used to relatch the delivery release mechanism just before the delivery slide returns, after delivery of the line, cannot be seen in Figures 16 and 17, but can be seen in Figure 18.

The lower end of spring (2) is attached to a pin in the back of lever (5) and in normal position, the spring is loaded so that it will rotate shaft (7) with its collar and levers, downward when release lever (1) is actuated by the L-11 solenoid (A).

When solenoid L-11 is energized, its actuating pin (14) forces the lower end of release lever (1) forward. Release lever (1) has a cut-out above its pivoting point which fits in a notch in the rear of collar (4) to hold the collar and shaft assembled against the pressure of spring (2). The notch in collar (4) can be seen at the top of the collar in Figure 17. When release lever is actuated by solenoid L-11, collar (4) is released and spring (2) pulls the rear of lever (5) upward which rotates shaft (7) with its collar and levers. In normal position, release lever (1) is held in contact with collar (4) by a small spring fastened to the lower end of the release lever.

The rotation of the shaft through link (8) attached to lever (9) at the right-hand end of the square shaft (10), pivots the square shaft. Since the No. 2 and 3 fingers (11) and (12) pivot with the square shaft, they pivot down into position behind the last matrix in the assembled line. This is shown in Figure 17, where the No. 2 finger is shown as it moves away from the No. 3 finger as the line is delivered.

Near the completion of the downward movement of the No. 2 and 3 fingers, pin (13) in lever (5), contacts delivery latch (20) (Figure 17), forcing the left hand side of the latch upward to release the delivery slide latch which is attached to the delivery slide casting. The delivery lever spring then causes the delivery lever to move the delivery slide with the assembled line of matrices between the No. 1 and No. 2 fingers to the left, to deliver the line into the first elevator jaw, leaving the No. 3 finger for the matrices in the next line to assemble against.

As soon as the assembled line of matrices is fully in the first elevator jaw, the automatic start switch MS 30 is actuated by the delivery slide,

which de-energizes the L-15 cam shaft brake and energizes the L-14 cam shaft clutch which starts the machine cycle.

When the delivery slide returns after the line has been delivered into the first elevator jaw, shaft (7) with its collar and levers is pivoted to normal position (which will be explained under "Relatching of No. 2 and 3 Finger Release Mechanism) and the notch in collar (4) will engage in the cut-out in release lever (1). The shaft (7) will then remain in its normal un-released position, until the delivery solenoid L-11 is energized for delivery of the next line or unless the top of release lever (1) is pressed to the rear to release the No. 2 and 3 fingers manually.

Lever (19) in Figure 16 is a safety lever. It has a notch in it which will keep lever (5) from pivoting downward, if the No. 3 finger is not in its "home" or normal position. When the No. 3 finger is in its normal position, it forces the lower end of safety lever (19) to the right so that its notch is away from lever (5). Safety lever (19) has a small spring to keep it to the left whenever the No. 3 finger is not in normal position.

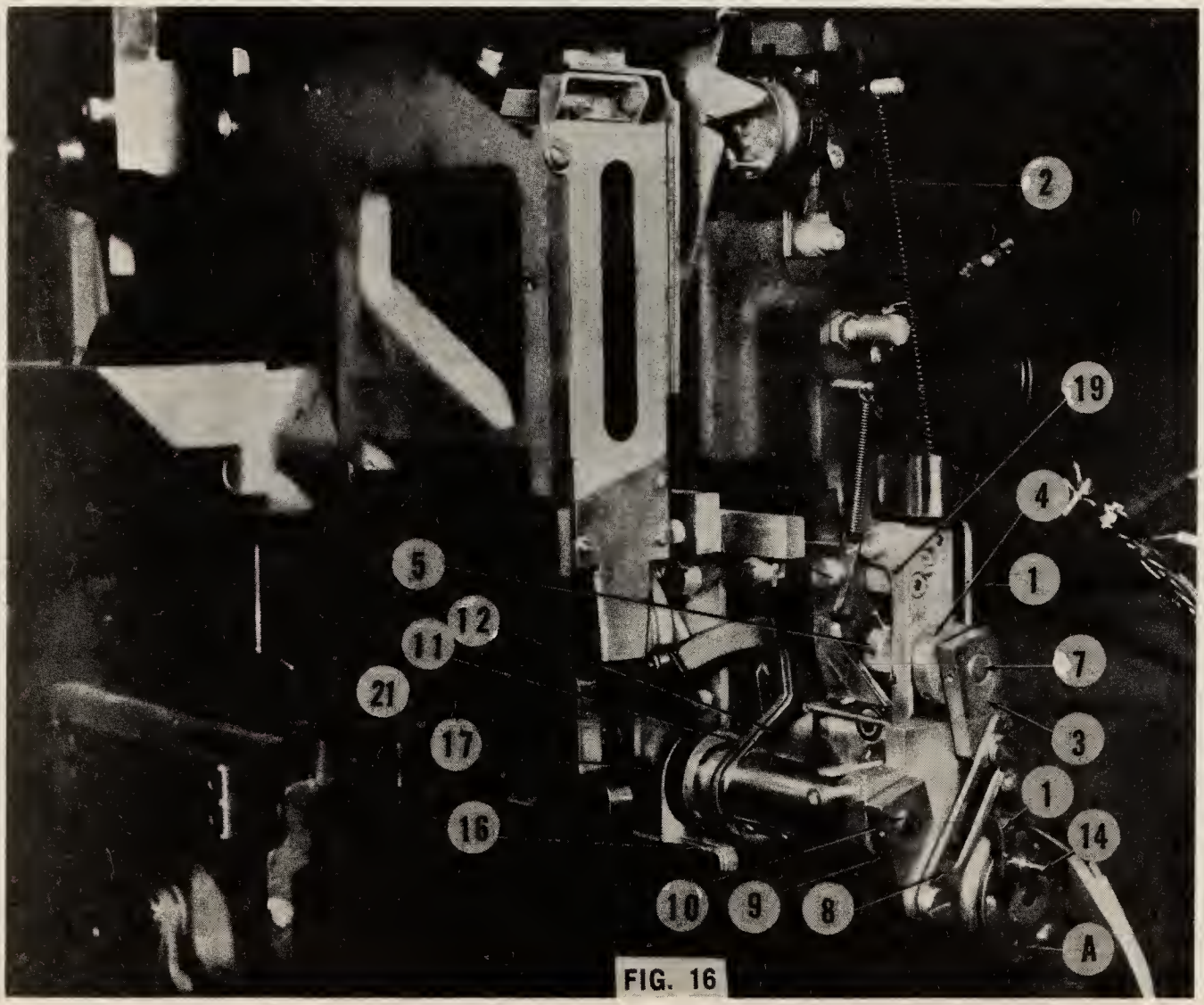


FIG. 16

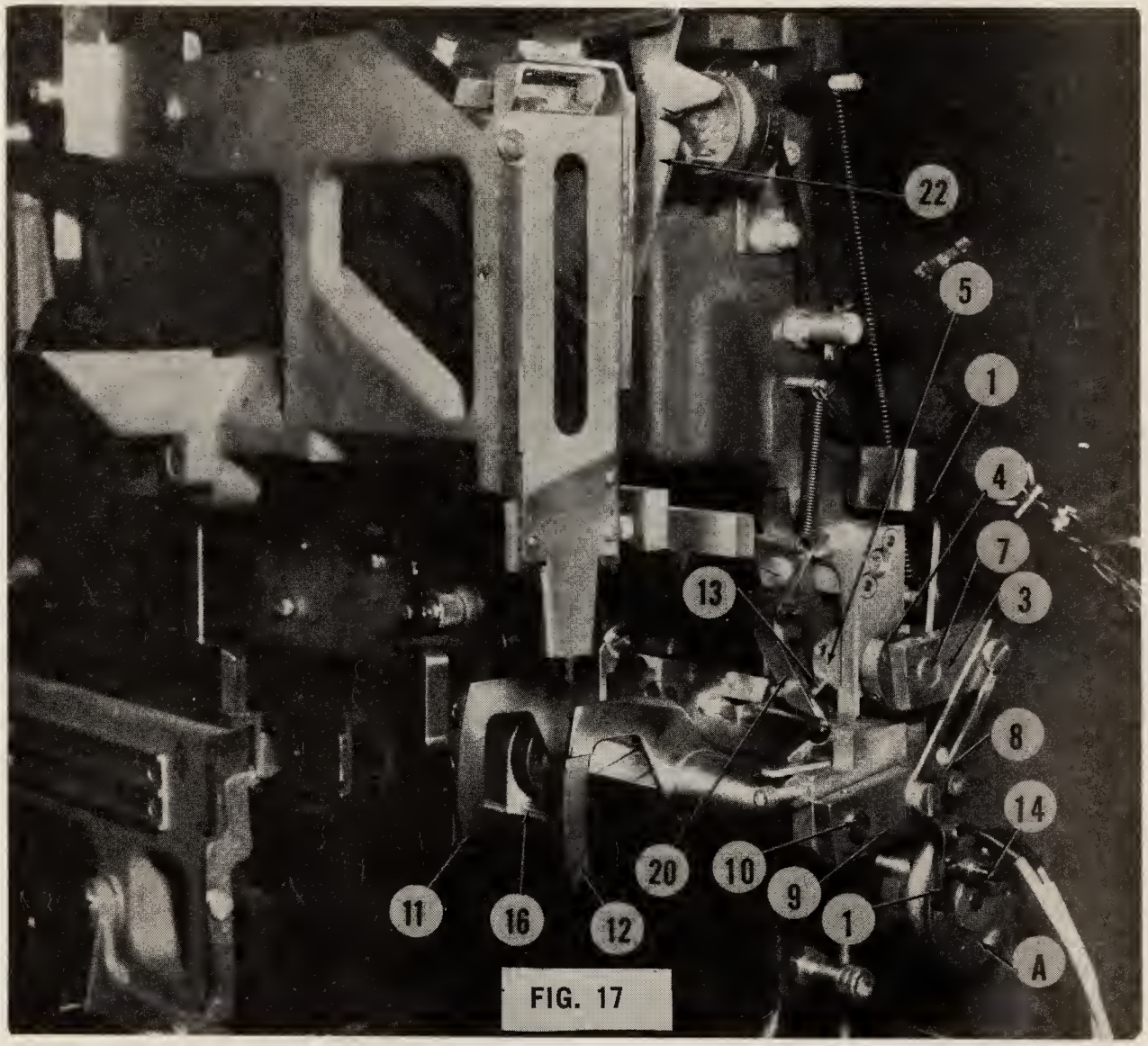


FIG. 17

Release of Assembler Finger Brake

When the square shaft pivots prior to delivery of the line, automatic finger brake release switch MS 20 is released, through the movement of a rod connected to the left-hand end of the square shaft. This energizes the brake solenoid L-23 to release the brake so that the assembler slide is free to move to the left as the line is delivered.

Separation of Assembler Slide Latch from the No. 1 Finger Catch (Figs. 8, 17 and 17A)

When the delivery slide is released and moves to the left, the assembler slide (4), Fig. 8, moves with it, since catch (16) on the bottom of the bearing (17), Fig. 16 to which is fastened the No. 1 finger, is engaged with the notch of latch (28), Fig. 8 which pivots on a bracket attached to the end of the assembler slide. Latch (28) is held in normal position with its notch horizontal, by a small spring.

When latch (28) contacts camming latch (30) which is fastened to the swinging front casting, the side with the notch in it pivots downward, which causes the No. 1 finger catch (16) to separate and continue on with the delivery slide to deliver the line.

When the delivery slide returns, the No. 1 finger catch (16) depresses the notched side of latch (28) and engages in the notch. This action raises the other side of the latch so it will clear the camming latch (30), permitting the No. 1 finger to continue back to normal position pushing the assembler slide ahead of it.

The illustrations in Fig. 17A, show how this action takes place. The first view shows the No. 1 finger catch (16), engaged in the notch of latch (28) just before the latch strikes camming latch (30). In the second view, camming latch (30) has caused the latch (28) to pivot which releases the No. 1 finger catch from the notch and permits the No. 1 finger with the line of matrices and spacebands between it and the No. 2 finger to deliver the line into the first elevator jaw.

When the delivery slide returns after delivering the line, No. 1 finger catch (16) strikes latch (28), causing the left-hand side of the latch to raise and clear the camming latch (30). The No. 1 finger catch (16) then engages in the latch and pushes the assembler slide back to normal position as the delivery slide returns.

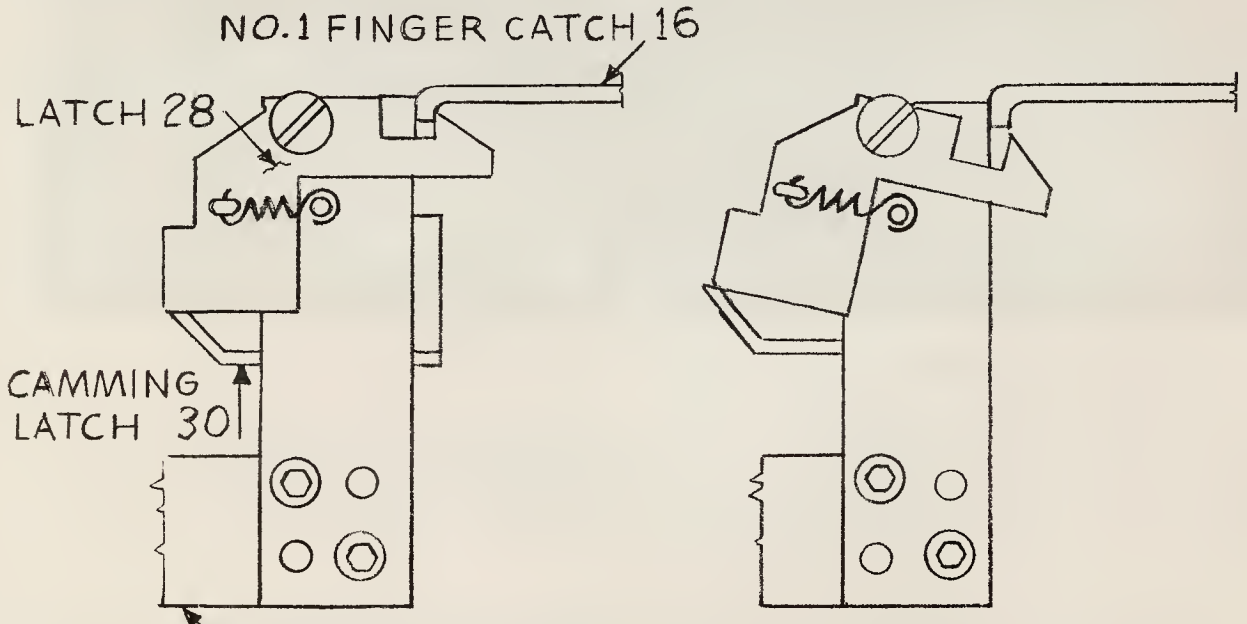


FIG.17A

Action of Buffer Spring (31)(Fig. 8)

Just before the No. 1 finger catch (16), Fig. 16, separates from the assembler slide latch (28), so that the No. 1 and No. 2 fingers with the

line of assembled matrices, can continue on to deliver the line to the first elevator jaw, a buffer spring (31), Fig. 8, contacts stud (32). This puts return pressure on the assembler slide to aid in separating the assembler slide latch (28) from the No. 1 finger catch (16).

Return of the Delivery Slide

When the No. 2 and 3 fingers are in normal unreleased position, a cam latch (shown in Fig. 24), fastened to the right side of the delivery slide, is held disengaged from the No. 2 finger by a flat surface at the back of the No. 3 finger. When the No. 2 and 3 fingers pivot downward with the square shaft at the start of the delivery cycle, this cam latch engages with the No. 2 finger and holds it and the square shaft in the down position.

As the delivery slide returns by action of the delivery cam and lever, the No. 2 finger remains in its down position until the cam latch contacts the flat surface on the back of the No. 3 finger. This forces the cam latch to the rear and disengages it from the No. 2 finger. The cam latch pivots on a shoulder screw and a small spring holds it in its forward position, until it is forced backwards by the No. 3 finger.

With the No. 2 finger released and consequently the square shaft, a spring attached to the left-hand end of the square shaft, pivots the shaft up and the No. 2 and 3 fingers pivot up with it, and continue moving to the right, back to their normal position.

In the meantime, the No. 1 finger moves against the line of matrices which had been assembling against the No. 3 finger, and the matrices continue to assemble, but against the No. 1 finger, until the line is delivered and then the process repeats itself.

No. 2 and 3 Finger Spring Latch

When the No. 2 and 3 fingers pivot upward and return to the right to their normal position as the delivery slide returns, they depress a spring latch in the face plate. After the fingers move past the spring latch, it resumes its normal position and prevents any movement of the No. 2 and 3 fingers to the left, until the square shaft pivots with the No. 2 and 3 fingers. See Figure 23 for proper clearance between the spring latch and the No. 2 finger.

Relatching of No. 2 and 3 Finger Release Mechanism (Fig. 18 and 18A)

Before the delivery slide returns to normal position, after delivering the line, the No. 2 and 3 finger release mechanism must first be relatched, or returned to its "up" position so that the delivery release latch will be in position to engage the delivery slide latch when the delivery slide returns.

The relatching operation is accomplished by the roll (1) on the delivery lever (2) striking cam plate (3) as the delivery lever returns. This pivots the right side of the cam plate (3) downward and rod (4) connected

between the cam plate (3) and lever (6), pulls the rear end of lever (6) downward. This action rotates the delivery release shaft (7), Fig. 16, to its normal position and the cut-out in release lever (1), Fig. 16, then engages in the notch in the rear of collar (4), Fig. 16, and the delivery release mechanism is then relatched in its normal position.

Lever (5), Fig. 18, on the cam plate (3) is used if the delivery release mechanism is relatched manually.

Figure 18 shows the relatching cam plate (3) before the delivery lever returns to force the right end of the cam plate downward to relatch the delivery release mechanism.

Figure 18A shows the roll (1) on the delivery lever starting to force the cam plate downward starting the relatching operation.

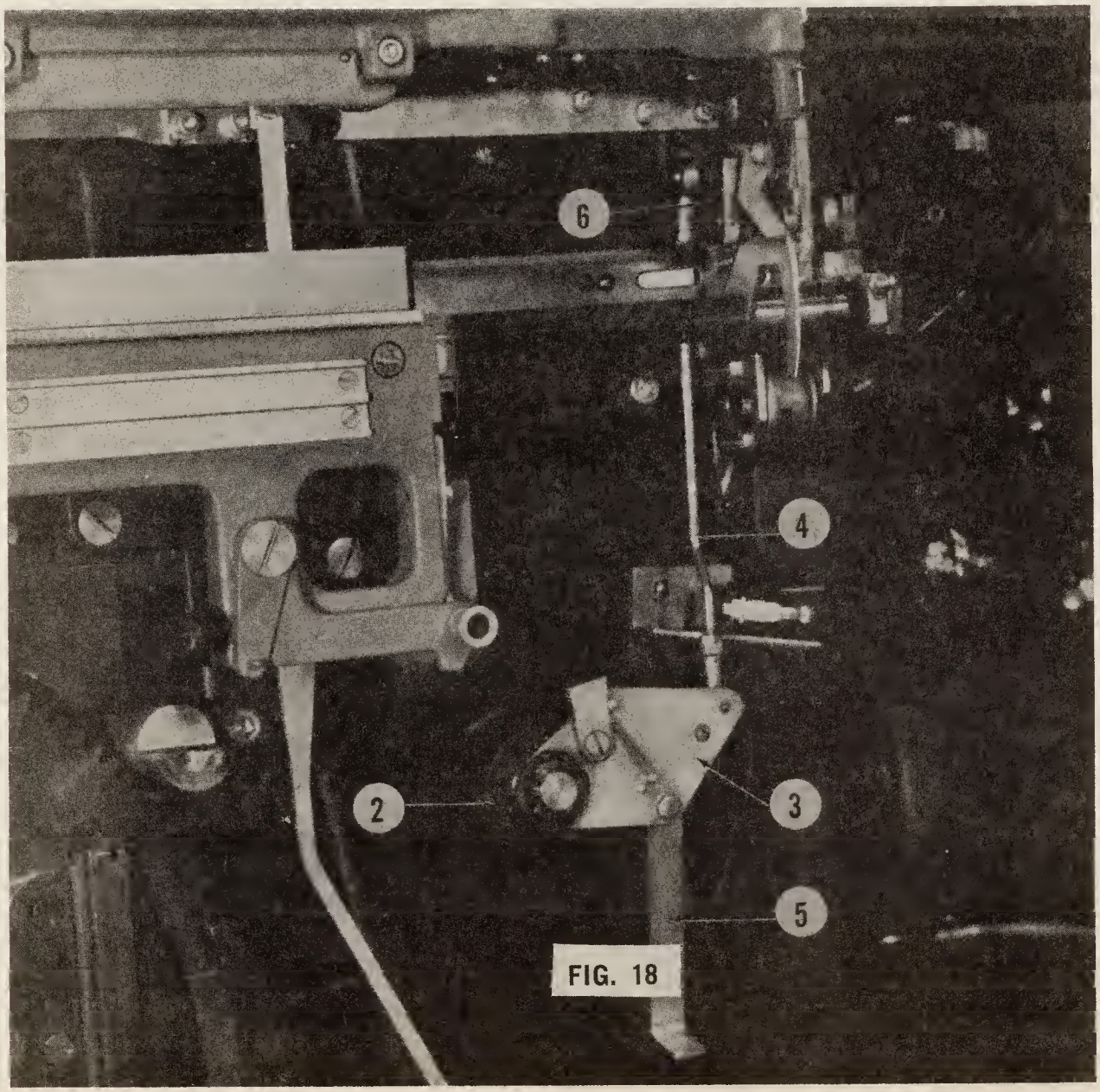


FIG. 18

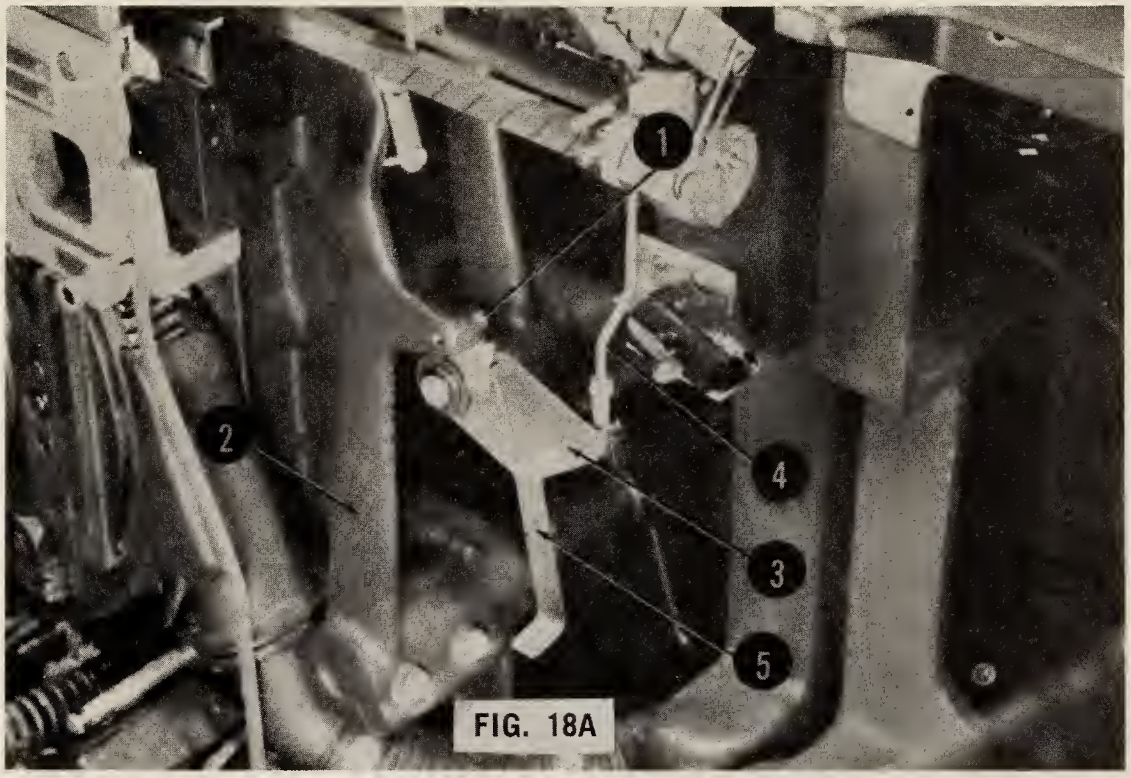


FIG. 18A

Adjustments for Line Delivery

(A) Delivery Slide Latch (Fig. 19)

Adjust the delivery slide latch so that there is 1/4" clearance between the delivery slide casting and the No. 2 finger. Adjustment is made by first loosening the two screws (B) and then adjusting screw (A) to obtain the desired 1/4" clearance. Then tighten the two screws (B).

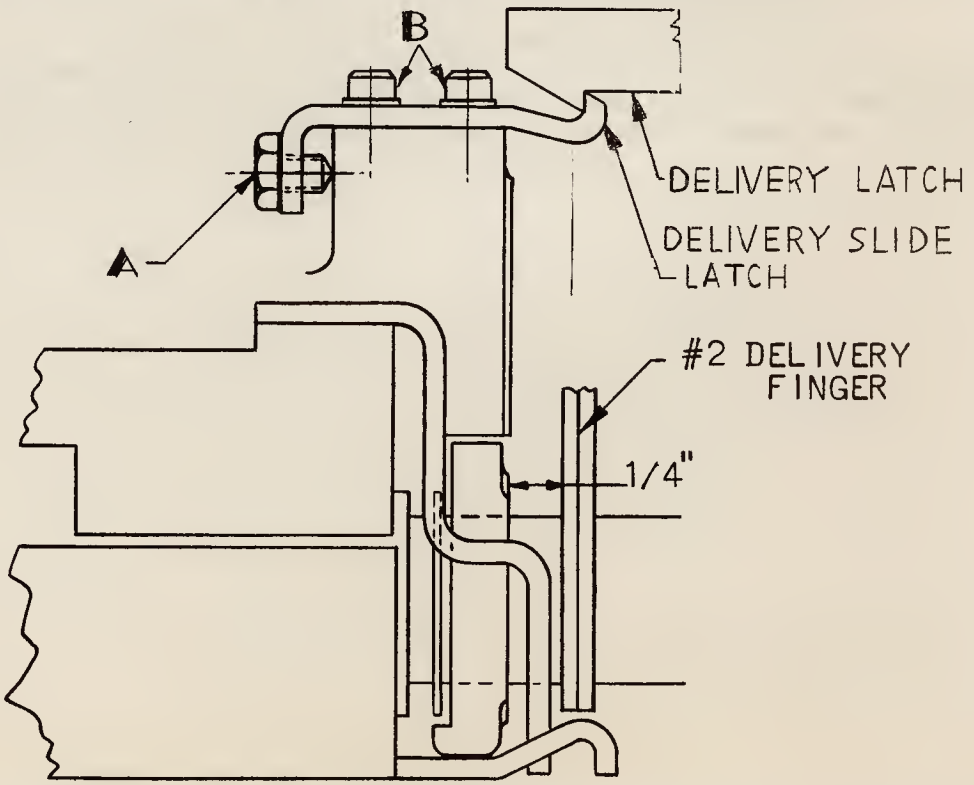


FIG.19

(B) No. 2 and 3 Finger Down Position Adjustment (Fig. 20)

The vertical bank screw (A) at left-hand end of square shaft, Fig. 20, should be adjusted so that the top of the No. 2 and 3 fingers are approximately parallel to the top of the delivery slide bar; when these fingers are in their down position. A check should be made to make sure that the No. 2 finger is engaged by the No. 2 and 3 finger cam latch (Fig. 24).

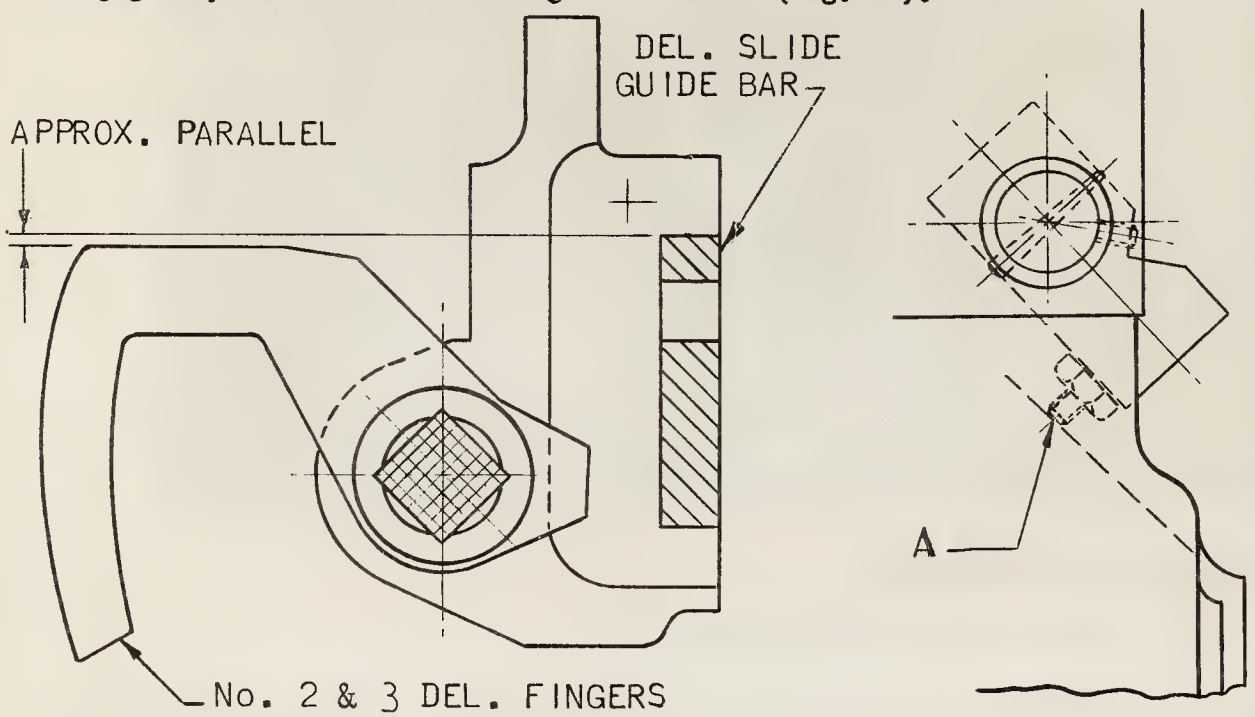


FIG. 20

(C) No. 1 Finger Brake (Fig. 21)

The No. 1 finger brake shoes should be adjusted using the adjusting eccentrics, so that the roll is 1/16" above the bottom of the brake release plate as shown. This produces the best braking action since center line (A) is as close as possible to center line (B) without actually going over.

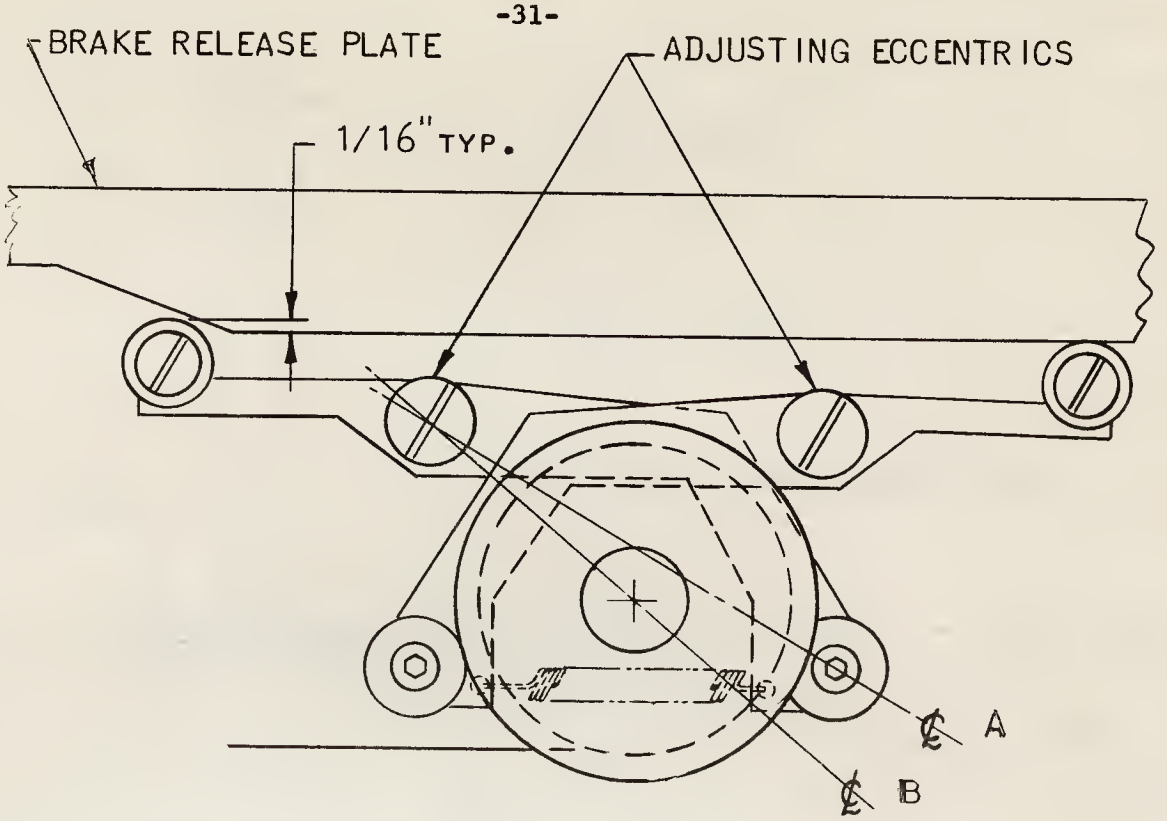


FIG. 21

(D) MS 33 Spaceband Safety Switch Lever (Fig. 22)

The spaceband safety switch lever should be located 1/64" to 1/32" below the top of the spaceband guide (point A) in the delivery channel front plate.

Adjust location of the safety lever by raising the bracket on which the safety lever pivots, up or down. The bracket is slotted for this purpose.

The camming surface (shown by the dotted line in the delivery channel front plate) is designed to cam the tops of the ears of the spaceband slide downward if the spacebands do not settle in place in the assembled line properly during assembly.

If the ear is above point (A), the spaceband would not be cammed down into position and it would then strike the spaceband safety switch lever and move it away from its normal vertical position. This would open switch MS 33.

If MS 33 is opened, K-6 relay cannot be energized when the assembled line is delivered into the first elevator jaw and automatic start switch MS 30 is actuated, and the cam shaft will not revolve. If this happens, push the high spaceband or spacebands down into proper position in the first elevator jaw and then move the safety lever to its vertical position and the machine will start.

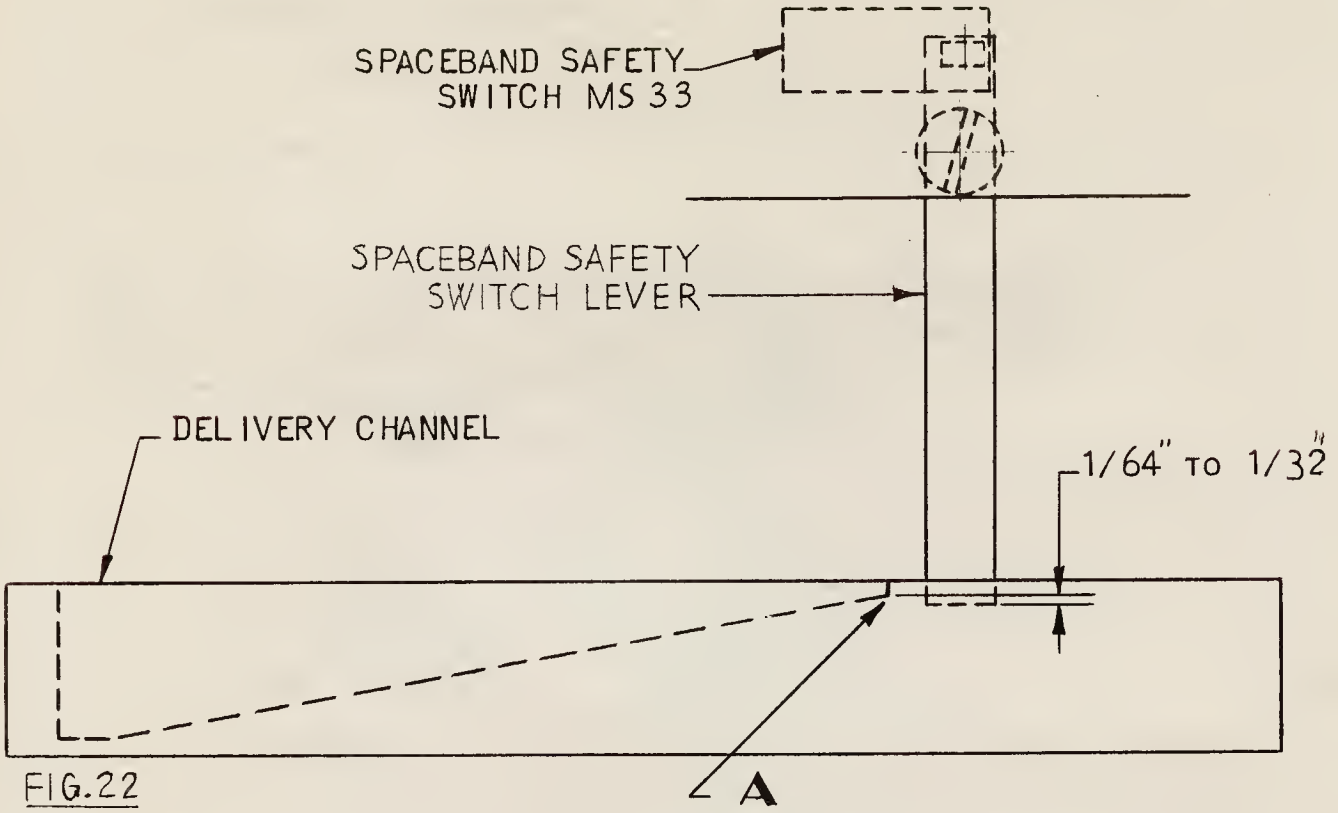


FIG.22

(E) Delivery Slide Stop Stud

The delivery slide stop stud located in the left side of the faceplate should be adjusted so that when a line of matrices is delivered in the first elevator jaw, the last matrix in the line is just inside the first elevator spring pawls.

(F) Delivery Lever (Fig. 23)

When the No. 2 and 3 fingers return to normal "up" position, there should be 1/32" overtravel between the No. 2 finger and the spring pawl (A) in the face plate. Adjustment is made by the delivery lever split hub.

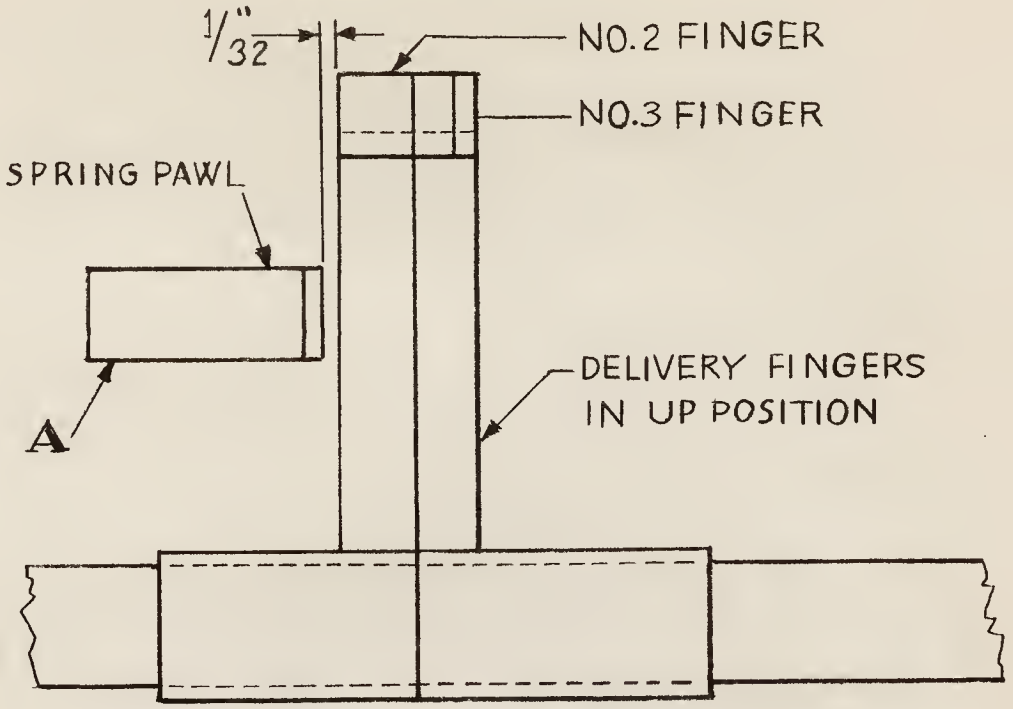


FIG. 23

(G) No. 2 and 3 Finger Cam Latch (Fig. 24)

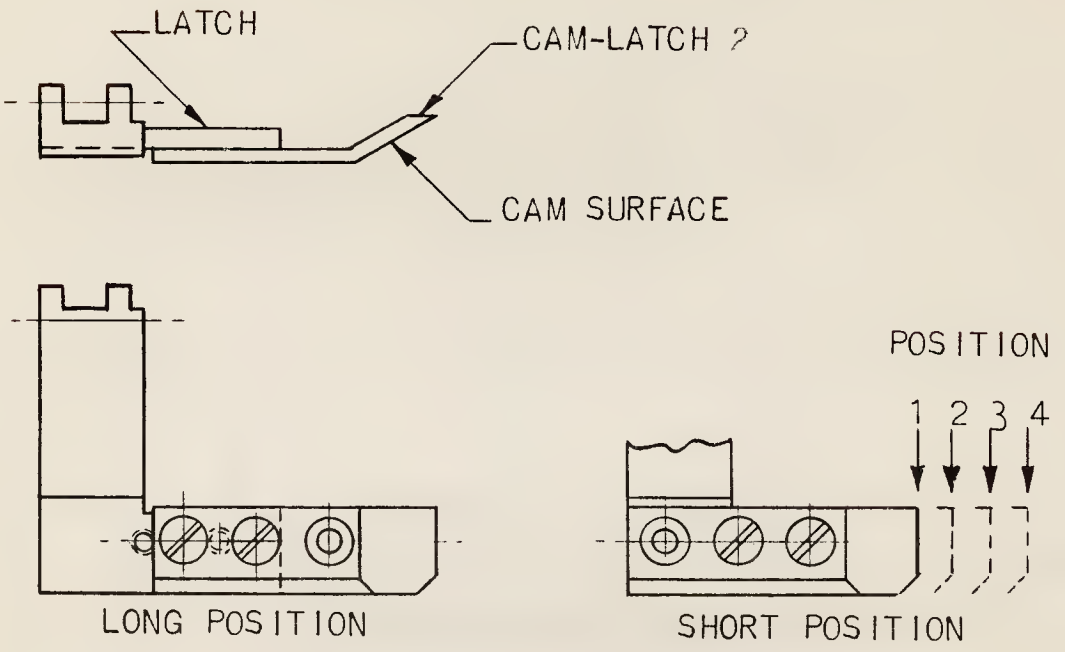
The No. 2 and 3 finger cam latch is adjusted differently for Elektrons cycling at 15 lines per minute and those operating at slower speeds (8 to 12 lines per minute).

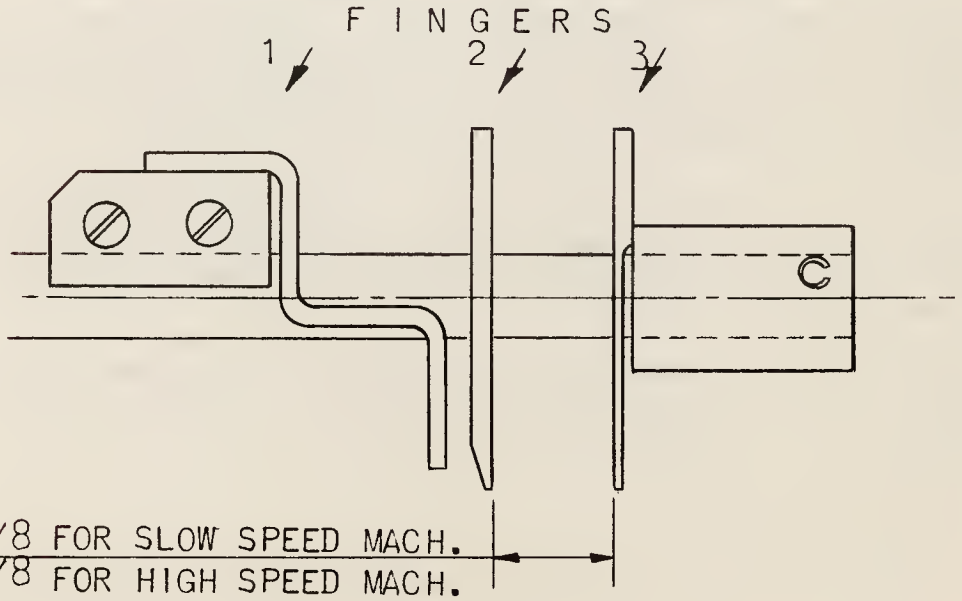
For high speed machines, the No. 2 finger should be approximately 5/8" from the No. 3 finger when the No. 2 finger is released by the cam latch (2) and the fingers just start to pivot upward and move to the right back to normal position. Adjustment is made by first removing the assembled cam latch. Then remove the two screws which hold the latch (1) to the cam latch (2), and locating the cam latch in position 3 or 4.

For slower speed machines, there should be approximately 3/8" between the No. 2 and 3 fingers when the fingers start to pivot to their "up" position. This is obtained by having the cam latch (2) in either the No. 1 or No. 2 positions.

If the Elektron does not have the adjustable cam latch as shown in Fig. 24, it can, if desired, be ordered by specifying one of 41-2610-01 latch, one of 41-2611-01 cam latch and two 38-0033-14 screws.

NO. 2 & 3 FINGER CAM LATCH





WHEN #2 & #3 FINGERS JUST START TO RELEASE TO THE UP POSITION.

FIG.24

(H) Vertical Alignment of First Elevator Jaw with Delivery Channel

The rails in the first elevator jaw on which the matrices and spacebands rest should be .001" to .010" below the corresponding rails in the delivery channel, when the machine is in normal position. Adjust the first elevator connecting link to obtain the desired setting. This is for Elektrons with the one-piece first elevator auxiliary lever.

For Elektrons with the two-piece adjustable first elevator auxiliary lever, first adjust the first elevator connecting link as shown in Fig. 24A, and then, using adjusting screw in auxiliary lever, adjust so that the rails in the first elevator jaw are .001" to .010" below the rails in the delivery channel.

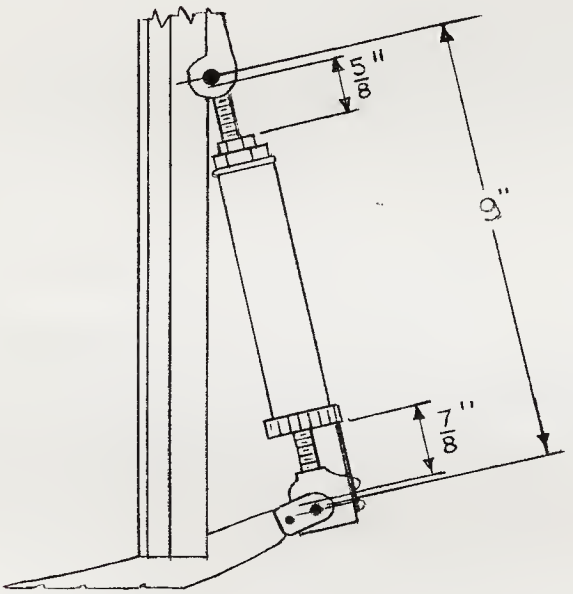


FIG. 24A

(I) In and Out Alignment of First Elevator Jaw With Delivery Channel (Fig. 25)

The distance between the front and back plates of the delivery channel is slightly less than that between the front and back plates of the first elevator jaw. This is to permit the matrices to be delivered into the first elevator jaw without their ears striking the first elevator jaw.

If necessary to reposition the delivery channel, remove its two holding screws and adjust the bushings underneath to obtain the condition illustrated in Fig. 25.

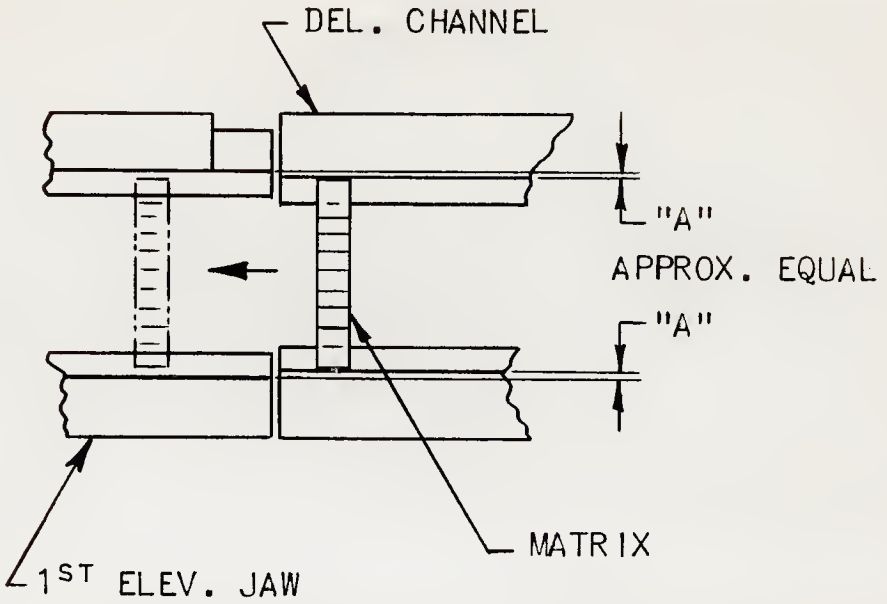


FIG.25

(J) Relatching of No. 2 and 3 Finger Release Mechanism (Fig. 18 and 26)

When the cam plate (3), Fig. 18, is forced downward by the return of the delivery lever, collar (4) on shaft (7), Fig. 26, there should be 1/32" of overtravel of the notch in collar (4).

The adjustment is made by the turnbuckles on the relatching rod, Fig. 18, and the turnbuckles should be adjusted until the 1/32" overtravel is obtained.

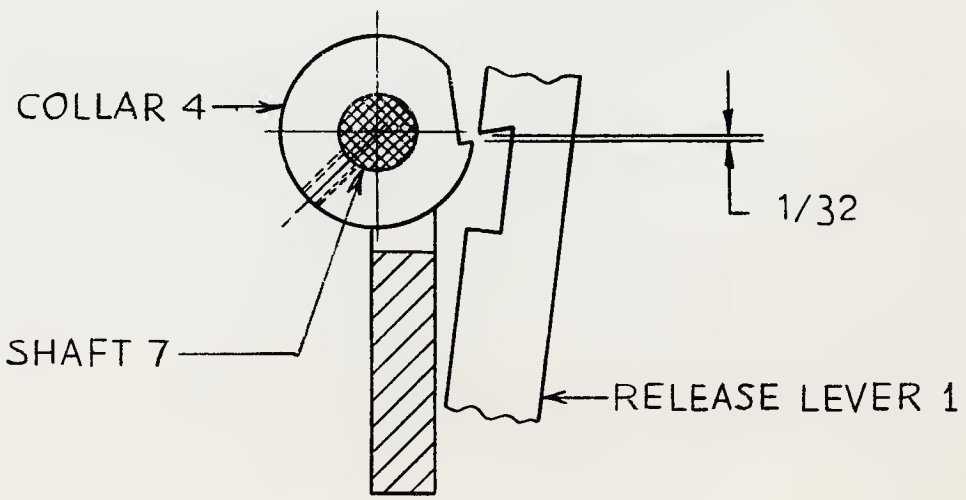


FIG.26

(K) Double "e" Operating Lever (Figs. 27 and 27A)

In the Elektron, the lowercase "e" matrices run in magazine channel 0 and 1. Every time the delivery lever returns after delivering a line, screw (1) in delivery lever contacts the double "e" operating lever (2), causing it to operate the double "e" shifting mechanism to move the reed from one position to the other.

Screw (1) in the delivery lever should be adjusted to operate the double "e" shifting mechanism so that the actuating lever will have 1/32" overthrow.

Fig. 27 shows screw (1) in the delivery lever just contacting the operating lever (2) as the delivery lever returns. Figure 27A shows the position of the operating lever (2) after the screw (1) has moved it to the right to operate the double "e" shifting mechanism.

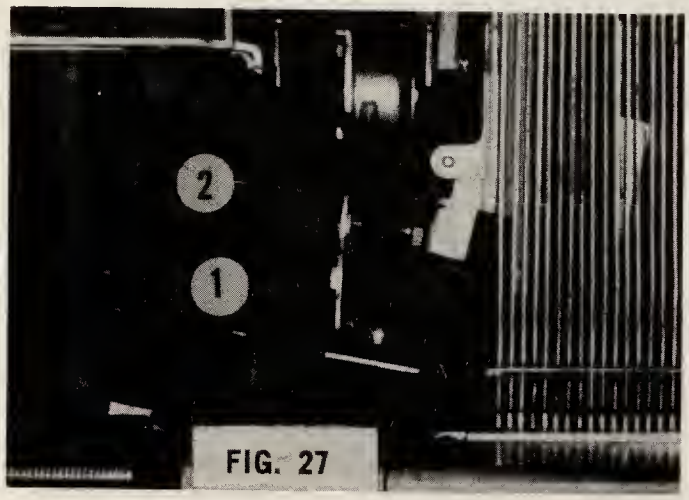


FIG. 27

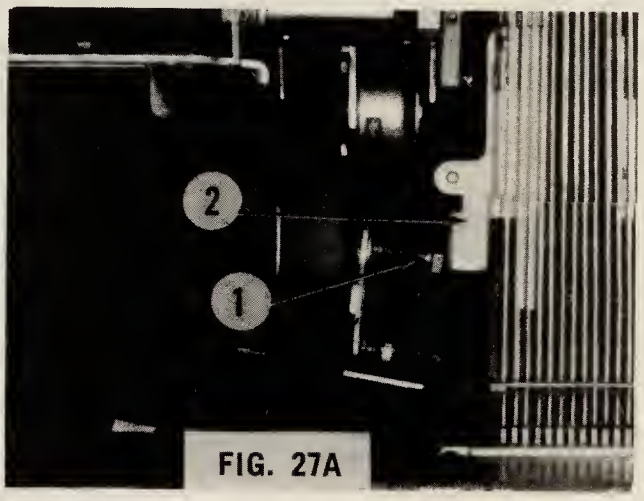


FIG. 27A

(L) No. 1 Finger Stop (Fig. 8)

Stop (33) in back of the assembling channel should be adjusted so that the No. 1 finger just clears a new assembler star after the assembled line has been delivered and the No. 1 finger returns.

(M) Line Measuring Slide Stop (Fig. 8)

Stop (34) should be adjusted so that when the line measuring slide (4) returns after the line is delivered, the pointer on slide (4) will be on zero.

(N) Line Delivery Micro-Switch Adjustments

1. MS 18 - Delivery Slide Switch

This switch should be positioned so that the switch opens after the delivery slide has moved 1/16" away from its latched position.

Adjustment is made by shifting the plate to which MS 18 is attached.

2. MS 45 - Long Line Cancelling Switch

This switch should open when the delivery slide has moved 1/16" away from its latched position.

Adjustment is made by shifting the plate to which MS 45 is attached.

3. MS 21 - Manual Delivery Switch (R.H.)

No adjustment necessary.

4. MS 22 - Manual Delivery Switch (L.H.)

The banking screws should be adjusted so that the far end of the switch operating lever has a total travel of 3/8" plus or minus 1/16". The MS 22 switch should be actuated during the last 1/8" of the travel as the lever is lifted.

5. MS 20- Automatic Assembler Finger Brake Release Switch (Fig. 28)

The switch should be held actuated when the No. 2 and 3 fingers are in their normal or "up" position. MS 20 should be released when the fingers have pivoted down to a point where there is 1/4" space between lever "A" and pin "B".

Adjustment is made by shifting the collar (1) on rod (2). The collar is held to the rod by a small set screw. Fig. 28 shows the position of the collar when MS 20 is held actuated and also the position of the collar when the square shaft has pivoted downward and the switch has just been released.

The position of the collar should be checked at intervals to make sure it has not shifted. If MS 20 is released during assembly of the matrices, the assembler finger brake will be released which will prevent correct assembly of matrices.

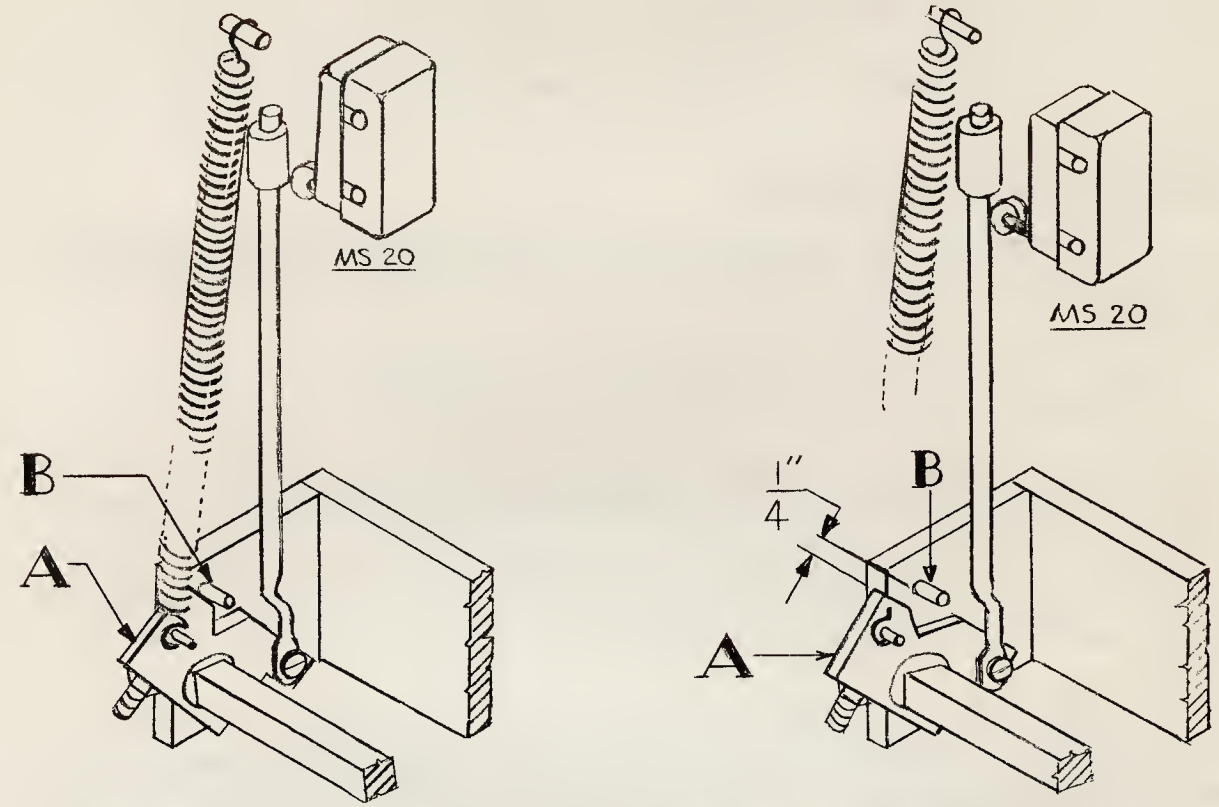


FIG.28

6. MS 30 - Automatic Start Switch

This switch should be positioned so that it is actuated 1/64" to 1/32" before the delivery slide banks on the delivery slide stop stud, as the delivery slide delivers the line into the first elevator jaw.

Before MS 30 is positioned, make sure that the delivery slide stop stud has been set correctly. See page 32, "Delivery Slide Stop Stud".

7. MS 46 - Overthrow Finger Brake Release Switch

Adjust the actuating screw in the delivery lever so that MS 46 is actuated during the overthrow portion of the return stroke of the delivery lever.

Care should be taken to make sure that switch MS 46 is not actuated when the delivery slide is latched in normal position.

8. MS 33 - Spaceband Safety Switch

MS 33 should be held actuated when the spaceband safety switch lever is in its normal vertical position and should be released when the bottom of the lever is moved to the left. (See Fig. 22).

Adjustment of the switch is made by shifting the switch on its bracket.

Lubrication of Delivery Mechanism

Referring to Fig. 17, Anderol Grease (40-2515-01) should be used on the surface of the delivery latch (20) which pin (13) contacts to start the delivery cycle.

Anderol Grease should also be used on the connecting link (8), and on the notch in collar (4).

The square shaft should have a light film of Anderol Grease applied to make sure that the delivery slide and the No. 2 and 3 fingers slide properly.

There are oil holes provided in the bearings at each end of the square shaft and timer oil (40-2527-01) should be used in these two places to insure that the square shaft will pivot correctly.

Delivery Timer

The electrical function of the delivery timer mechanism is described in Service Instruction No. 21 - "Elektron Electrical System". In Service Instruction No. 22, the mechanical operation of the timer mechanism is described.

Fig. 29 shows an illustration of the complete timer mechanism, assembled to the machine control printed circuit board to which are assembled the seven timer switches TS-1 to TS-7, together with the five control relays. The printed circuit is fastened to the underside of the timer casting by four screws.

The delivery timer consists of eight cams plus two slip clutches and two latch solenoids. Seven of the cams are fastened to a sleeve, the right end of which has three notches. The sleeve with the seven cams attached, is kept from rotating by a latch which in normal position engages one of the three notches of the sleeve. When solenoid L-21 is energized, it raises the latch, permitting the slip friction clutch, driven by the timer motor, to rotate the sleeve with its seven cams; which operate the seven timer switches at the proper time.

The left-hand slip clutch rotates a cam (called the spaceband cam) when solenoid L-22 is energized. This raises the latch clear of one of the notches in the cam, permitting the cam to rotate. Solenoid L-22 is energized when a spaceband is released. When the spaceband cam rotates, it actuates timer switch No. 1 (TS-1). This energizes the star wheel pusher solenoid to push the line of matrices in the assembling channel to the left to allow room for the spaceband to assemble behind the last matrix of each word.

TS-1 is also actuated prior to the delivery of the line by the first cam on the left assembled to the sleeve, to energize the star wheel pusher solenoid and move the assembled line to the left, to allow the No. 2 and 3 fingers to pivot down behind the last matrix in the assembled line, so that the line can be delivered.

The timer cam shaft is driven by a fan cooled, constant speed, continuous duty motor. This motor operates on 30 volts alternating current. To reduce the timer cam shaft speed to 100 rotations per minute, a train of gears is used, as shown.

The motor shaft is connected to the timer shaft by a coupling, a spring pin being used to fasten the coupling to the motor shaft and a cotterpin to fasten the timer cam shaft to the coupling.

Each end of the timer cam shaft is supported by a small oilite bearing in the side plates of the timer casting, and there is an oilite bearing in the left end of the flanged sleeve to which the seven cams are fastened.

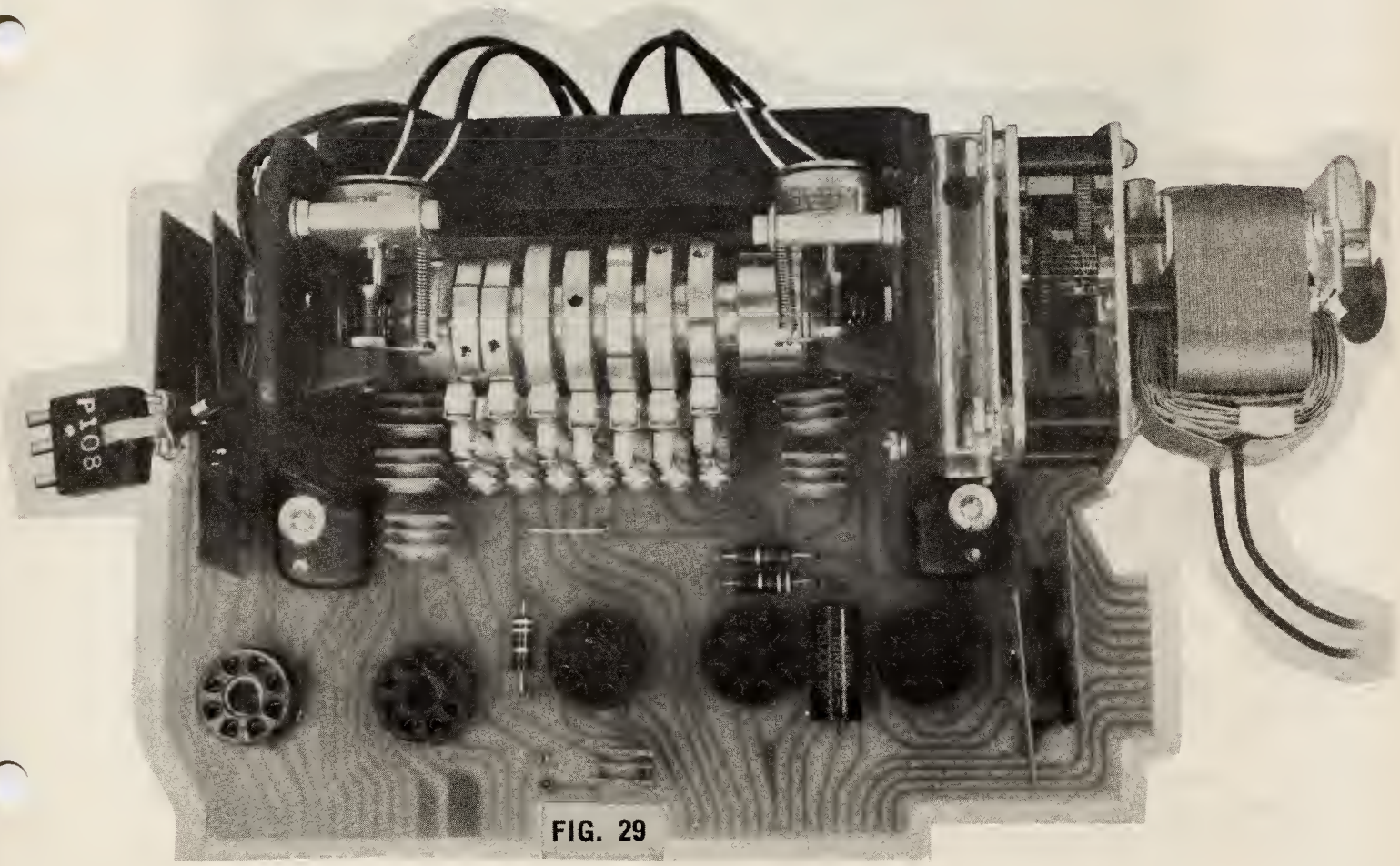


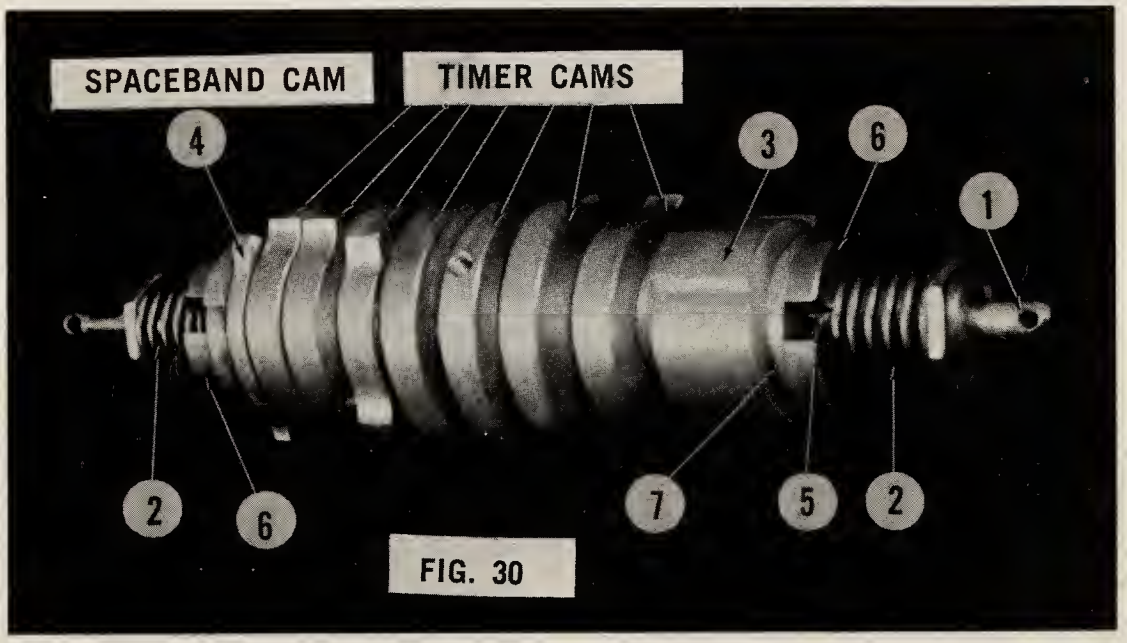
FIG. 29

Timer Cam Shaft Assembled (Fig. 30)

This view shows the timer cam shaft (1) assembled with the two slip clutches (2), the sleeve (3) to which is fastened the seven timer cams, and the spaceband cam (4). The left-hand and right-hand slip clutches are identical.

Each slip clutch is fastened to the timer shaft by a set screw (5) and the slip clutch revolves with the shaft, which is driven by the timer motor. An oilite friction (6) in the slip clutch revolves against a hub (7). The hub is part of the slip clutch assembly and the right-hand side of the sleeve to which the seven cams are attached, fits over the hub and is held to it by two set screws. The spaceband cam fits over the hub in the left-hand slip clutch assembly, and is held to the hub by two set screws.

When latch solenoid L-21 is energized, for instance, its sleeve with the seven cams is free to revolve and the oilite friction disk (6) by its pressure against the hub (7), causes the sleeve to rotate. Pressure of the oilite friction disk against the hub is regulated by a spiral spring and adjusting nut.



So that the internal construction of the timer unit can be readily understood, the following description should prove helpful.

Exploded View of Timer Cam Shaft, Cams and Slip Clutches (Figs. 31 and 31A)

Each of the two slip clutches consist of the following parts: slip clutch sleeve (8), with its set screw (5) to hold the slip clutch sleeve to the timer shaft; hub (7) in which is pressed a flanged oilite bearing (9); oilite friction disk (6), compression spring (10) and locknut (11).

The right-hand slip clutch when assembled with the component parts just described, fits into the right side of the sleeve (3), Fig. 31, to which the seven cams are fastened. The right-hand end is hollow for this purpose.

Two set screws in the sleeve (3) are tightened against the hub (7), which has the flanged oilite bearing pressed into it. Since the slip clutch sleeve (8) is fastened to the timer shaft by set screw (5), when the timer shaft revolves, it revolves sleeve (8), friction disk (6), compression spring (10) and locknut (11). Friction disk (6) revolves against hub (7), which is prevented from turning by the solenoid latch.

However, when solenoid L-21 is energized, the latch is raised above the notch in the sleeve so that the sleeve with its seven cams is free to revolve and the pressure of the friction disk (6), caused by compression spring (10), causes the sleeve and the seven cams to revolve to start the delivery cycle.

The left-hand slip clutch is identical to the right-hand, but in this case the slip clutch hub fits inside the spaceband cam and is held to the spaceband cam by two set screws. The spaceband cam has three notches in it, which the latch of L-22 solenoid engage and the spaceband cam also has three projections, equally spaced. One of these projections actuates TS-1 to energize the star wheel pusher solenoid whenever the latch solenoid L-22 is energized by the release of a spaceband from the spaceband box.

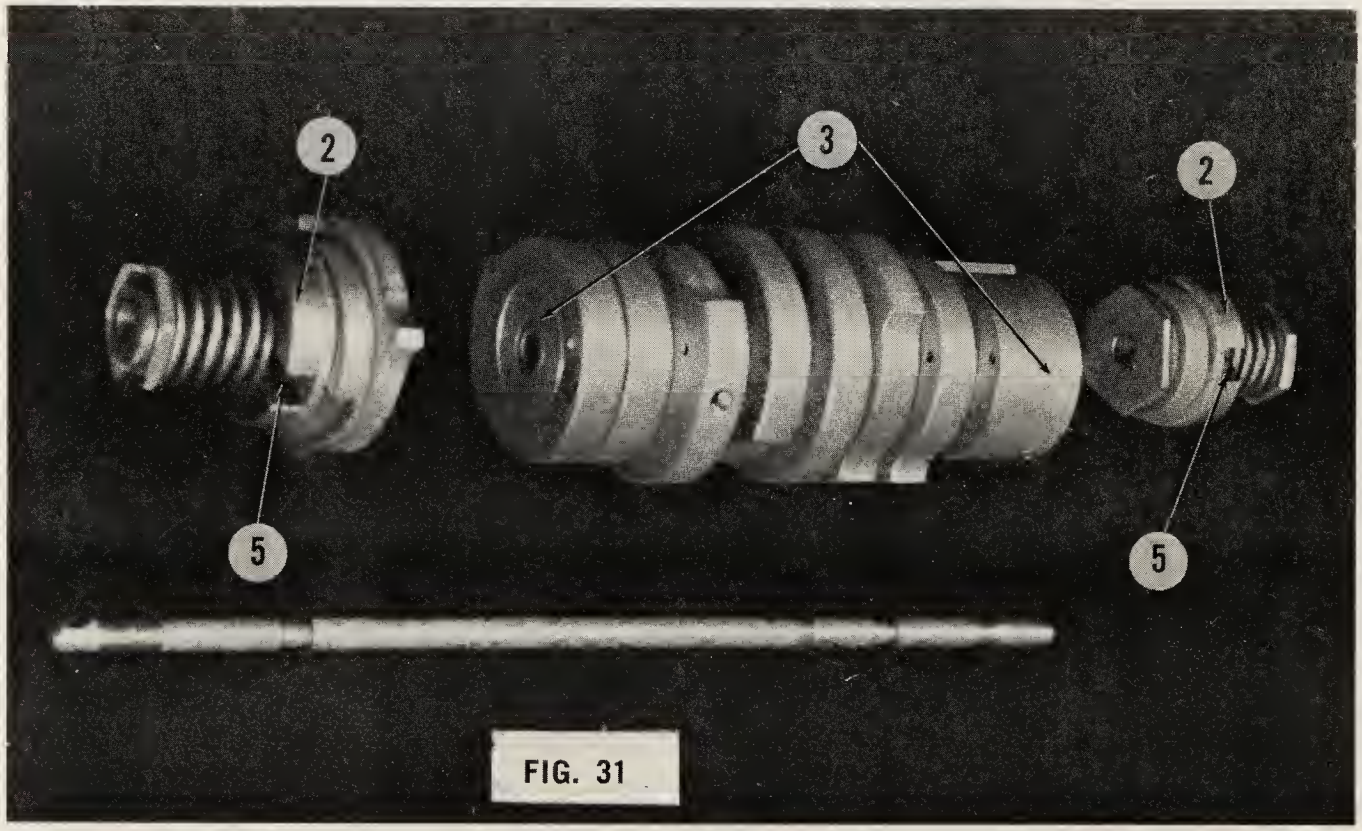


FIG. 31

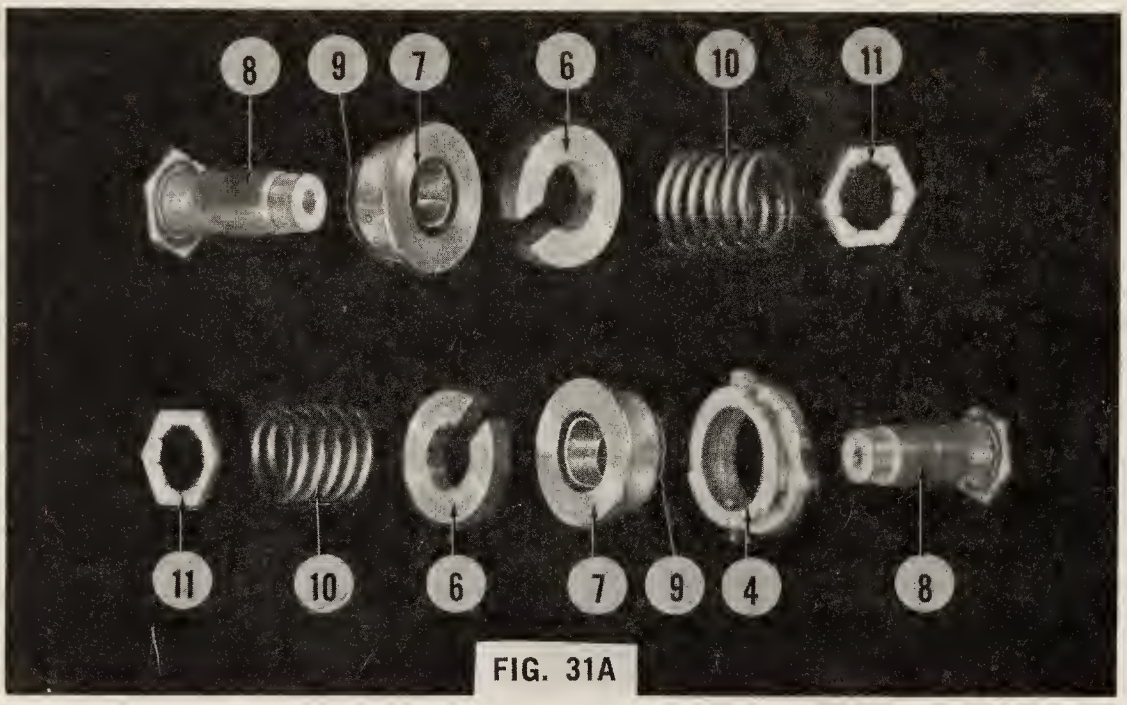


FIG. 31A

Adjustment and Maintenance of the Delivery Timer

Before the delivery timer is fitted into the power central of the Elektron at the factory, it is thoroughly bench tested to make sure it meets all specifications and operates properly. It receives its final test, as part of a new Elektron during the machine testing period.

Providing the timer switches are not disturbed after the Elektron is shipped from the factory, there are only two adjustments which may have to be checked. These are the setting of the coil springs to produce the proper slip clutch friction, and the setting of the solenoid latch adjusting stud which determines how far the latch rises above the notch in the spaceband cam or in the sleeve, when the latch solenoid is energized.

Adjustments of the Delivery Timer

(A) Slip Clutch Compression Spring

In each of the two slip clutches, this spring exerts spring pressure against the oilite friction disk, which in turn revolves against the hub of the slip clutch. When the sleeve with its seven cams is free to rotate, the pressure of the oilite friction disk against the hub causes the sleeve to rotate. Also, when the spaceband cam is free to rotate, the pressure of the friction disk against the hub, causes this cam to rotate.

The nut which regulates the pressure of the slip clutch spring should always be applied with the flat side facing the spring. On later Elektrons, two nuts are used, the end one acting as a locknut.

The nut should be turned clockwise until the left side of the nut is 17/32 (approximate setting) from the oilite friction disk. This will give the proper pressure of the friction disk against the hub so that the sleeve with its seven cams (for example) will rotate when released, without creating too much friction when the sleeve is held from rotating, to effect the timer motor.

Note: On later Elektrons, two nuts are used, one for adjustment and one to act as a locknut. The spring has been shortened and under these conditions the 17/32" setting should be 1/2".

To use the locknut on slip clutches originally equipped with the one nut, two of 41-2372-01 nuts and one of 41-1855-01 spring should be used.

(B) Solenoid Latches

1. Latch Solenoid L-21 and L-22 (Fig. 32)

In the construction of the latch solenoids, the solenoid coil or electrical field (1) is fastened to a latch plate (2) with this latch plate fulcrumming on a stud (3). The latch plate is kept in its down or normal position by a small coil spring and the front end of the plate rests against a notch in sleeve (4) (using latch solenoid L-21 as an example) to prevent the sleeve with its seven cams from rotating until the solenoid is energized.

When the solenoid is energized, the armature (5) is drawn against the field and a stud fastened to the armature pressing against stud (6), causes the front end of the latch plate to rise above the projection, permitting the slip clutch to revolve the sleeve with its seven timer cams.

To adjust either the L-21 or the L-22 latch solenoid, loosen locknut on adjusting stud (6) and turn stud so that when the solenoid is energized and the latch plate pivots upward, the end of the plate will clear the notch by 1/64 - 1/32", permitting the sleeve or the spaceband cam to revolve.

To check the action of the solenoid, place the index finger under the latch plate at its rear and with the thumb press lightly on the armature plate. This will cause the end of the latch plate to rise and the clearance can be checked and adjusted, if necessary. Do not push up with the index finger.

2. Maintenance

Make sure that stud (3) on which the latch plate pivots is kept tight and lubricated at intervals with Timer Oil 40-2527-01, to make sure that there is no restraining action to the pivoting of the latch plate.

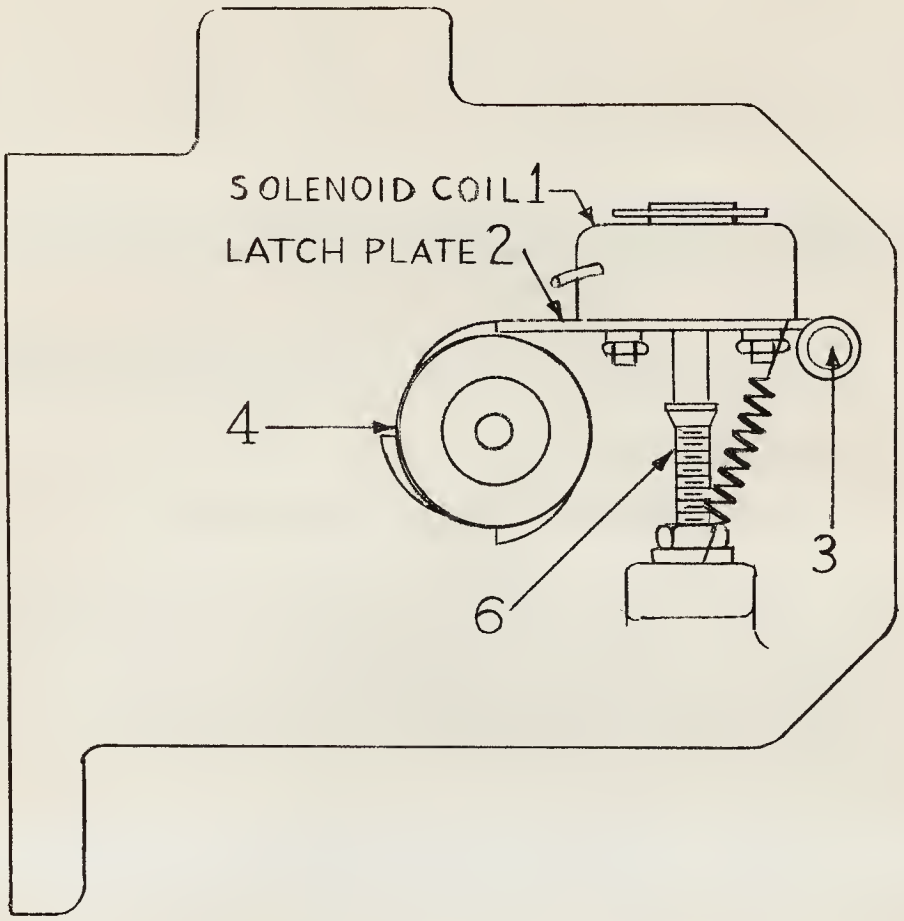


FIG.32

(C) Timer Switch Actuating Cams

The seven cams located on the sleeve of the timer are positioned to centralize over their timer switch roller with the exception of the first cam which actuates the roller of TS-1. Only the left-hand side of this first cam actuates the roller and this cam is positioned with its left side flush with the left-hand end of the sleeve.

All seven actuating cams are held to the sleeve by a set screw in each cam. Each cam has a part number stamped on it, and this part number must be in the right side facing the collar of the sleeve, and the alignment hole in each cam must be in line with the aligning hole in the collar.

(D) Removal of Timer Shaft, Cams and Slip Clutches

1. Remove Delivery Timer from Power Central.

2. Remove cotterpin from collar.

3. Loosen the set screw holding each slip clutch to the cam shaft.

4. Pull shaft out from the left of the bracket.

5. When the shaft is removed, there will be two assemblies:

   (a) The sleeve with its seven cams and the right-hand slip clutch assembly.

   (b) The left-hand slip clutch assembly with the spaceband cam.

   These two assemblies can then be disassembled if desired.

(E) Timer Switches TS-1 to TS-7

The timer cam shaft makes one revolution in 600 milliseconds or 6/10 of one second. In this short time, the seven timer switches are actuated by the timer cams, to complete the electrical timing cycle.

In order for the timer switches, therefore, to open and close correctly during this 6/10 of one second interval, they not only must be set accurately, but also they must release very quickly after having been actuated.

Timer Switch TS-1 (Star Wheel Pusher), TS-2 (Quadder Transfer), TS-6 (End of Cycle) and TS-7 (Delivery Release) have their switch contacts open in normal position and these contacts close when the switch actuating roller is on the high point of its actuating cam.

Timer Switch TS-3 (Delivery Slide Check) and TS-5 (Duplex Rail and Quadder Clearing) have their contacts held closed in normal position and these contacts open when the roller contacts the low point of the cam.

Timer Switch TS-4 (Delivery Completion Check) has two sets of contacts. The outer contact is closed in normal position, while the inner contact is open. (See Service Instruction No. 21, page 41, Fig. 15). The outer contact is opened by the low point in the cam operating TS-4, while the inner contact is closed.

(F) Adjustment of Timer Switches TS-1 to TS-7

Care should be used when checking the Timer Unit, so that the seven timer switches are not disturbed. These switches are set in the factory for proper contact gap and pressure of the switch rollers against their cams.

If it becomes necessary to readjustatimer switch, the following settings should be used.

The nylon roller of a switch should align horizontally with its cam within .015". The roller should be from .005 to .010" away from the cam surface when the roller is at the low point of the cam.

The seven timer cams are in "home" or "normal" position when the aligning holes in the cams are next to the switch rollers.

The air gap between switch contacts in open position should be 1/32". When the cam shaft is rotated by hand and the contacts close, they should close with an overtravel of at least 1/64".

Timer Switch No. 4 (TS-4) should be adjusted so that there is a definite interval when the center contact will not touch either the outer or inner contacts, while the center contact is transferring from one to the other.

Proper tools must be used to bend the switch leafs with rollers on them and the leafs which hold the contacts. A regular leaf adjusting tool is sold for this purpose, as well as a special contact cleaner. These two tools are shown in Fig. 33.

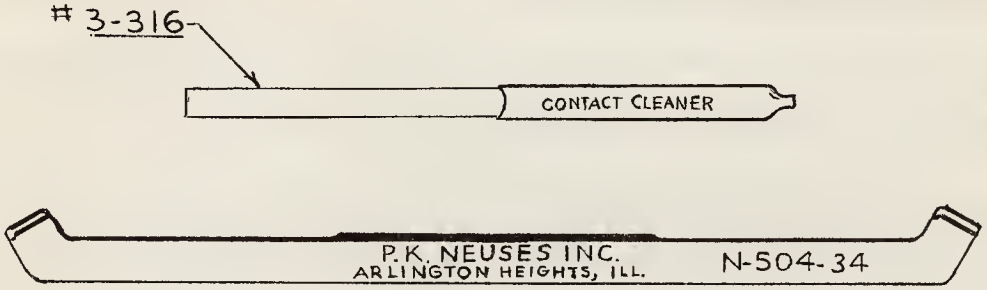


FIG. 33

These are standard leaf switch tools. The Mergenthaler Linotype Company does not supply these tools. However, they can be readily purchased in an electrical supply house or can be ordered from the manufacturer, "P.K. Neuses, Inc., Arlington Heights, Illinois".

Lubrication of Timer Motor and Timer Unit

The timer motor assembly consists of the motor plus the train of gears which reduce the speed to permit the timer cam shaft to revolve at 100 R.P.M.

Timer motor oil 40-2527-01 (1 oz. can) should be used in the two oil holes for the motor and also in the two oil holes for the reduction gear bearings. There are felt wicks for the motor shaft to retain the oil and there are also felt wicks for the reduction gear shaft bearings, for the same purpose. Three or four drops of timer motor oil every three to four weeks should be sufficient to lubricate the timer motor and the reduction gear shaft bearings.

Anderol Grease 40-2515-01 (1 oz. tube) should be used on the teeth of the reduction gears to reduce friction and prevent premature wear.

The Timer Motor Oil, in addition to the 1 oz. can, can be supplied in 3 oz. cans, 40-2527-03 and 1 pt. cans 40-2527-02.

The Anderol Grease, in addition to the 1 oz. tube, can be supplied in a 3 oz. tube 40-2515-03, and in 1 pound cans 40-2515-02.

Lubrication of Timer Cam Shaft

The cam shaft requires lubrication at the following places:

1. The felt wicks at each end of the cam shaft just inside the mounting bracket sides. Each of these felt wicks should be oiled once a month with four or five drops of timer oil, so that oil will get to each oilite bearing in the side plates and to the cam shaft at these points.

2. The flanged oilite bearing (9), (Fig. 31A) which is pressed into the hub (7) in each of the two slip clutches should be lubricated once a month so that the sleeve (8) will be lubricated as it revolves inside bearing (9).

To lubricate the right-hand slip clutch oilite bearing and the sleeve, use three or four drops of timer oil in the opening of the friction disk where the set screw is located. The oil will then get to the bearing and the sleeve.

This should be repeated for the left-hand slip clutch. Do not over oil, otherwise oil may get on the timer switch contacts.

July 19, 1965

ASSEMBLY PROBLEMS TAPE

I. If poor assembly results, the following procedure should be followed:

1. Clean starwheel and matrix delivery belt

2. Check starwheel setting (1/32 beyond pawls)

3. Check gate and back rail pawl tensions (tension should be approximately 1-1/2 oz.)

4. Check that matrix buffers are tapered to factory specifications - 1/32nd front; 1/16th back

5. Check gate width (.020 - .030 beyond ears of matrices)

6. Check assembler brake (9 to 14 lbs. push)

7. Check adjustment of Assembler Brake.
Set so that #1 Finger does not slam into assembling line when returning. For faster braking action adjust MS-20 switch actuator.

8. Check tension on #1 Finger - 1-1/2 lbs to 2 lbs.
#3 Finger - 2 lbs. breakaway (no oil or grease on braking surface of shaft)

9. Check Jog (3/32 to 1/8 maximum)

10. Check inhibitor spring (1/16th down when long line switch is actuated). Make sure there is no bind where inhibitor pivots.

11. Check Star wheel tension. Turn nut all the way in and back off one turn. If cog belt is held, star wheel should slip; also check cog belt for missing or badly worn teeth.

12. Check assembler chute finger (set 1/4 in. for Universal Finger) and set flexible guide to buff thinnist matrix.

13. Check for bind in assembler pulley.

After these checks have been made, disconnect spaceband timer plug, P-101, (under keyboard) and assemble matrices by tape. Matrices should assemble smoothly.

II. Reconnect timer plug P-101. Set timer switch on high and turn potentiometer 1/2 turn to the left. This is a rough setting.

(a) Check bands by slowly turning release solenoid by hand.

1. Band should clear detaining plate. Lift should pick up one band at a time above both pawls simultaneously. Band should drop into chute.

2. Check detaining plate .025 above band thickness.

3. Check squareness and alignment of spaceband chute with assembler starhweel.

4. Check response of spaceband timer relays K-101 and K-102.
   a. Depress spaceband lever (rhythmatically). Check spaceband release solenoid - it should act sharply and consistently. No sluggishness.

   b. Also check spaceband timer solenoid (L-22); it should act sharply and spaceband cam actuating TS-1 should not be sluggish. (Make sure there is .010 clearance between spaceband cam and main cam shaft on timer.) Also check tension on clutch 17/32 for single nut; 1/2" for double.

III. Assemble a line and hold.

1. Observe line for transpositions
   a. If band falls too soon, turn potentiometer screw clockwise, giving more delay to band
   b. If band falls too late, turn screw counter clockwise.

2. If bands are high (tripping MS-33) this indicates too much delay - turn screw counter clockwise

3. If bands do not get into line, this indicates not enough delay or spaceband reed switch is "making" on first rise. To check this, remove keyboard driving belt and turn pulley by hand. Spaceband switch should clear on first rise and "make" on second.

4. Check spaceband keyboard cam and rubber roller.

C. Mattei
General Service

ELEKTRON TECHNICAL DATA

Sales-Service Department • Mergenthaler Linotype Co. • Brooklyn 5, N.Y.

DAILY CHECK LIST FOR THE ELEKTRON

1. Assembler Chute Finger

This finger should be adjusted to just clear the thickest matrix in the font. When the Universal Chute Finger is used, adjust the finger so that it is ¼" from the assembler chute rails.

2. Star Wheel Tension

For proper star wheel tension, the adjusting nut on the rear of the assembler pulley shaft should be turned all the way in and then backed off approximately one turn.

3. Normal Position of Star Wheel

When assembling matrices, the star wheel should deposit the matrices 1/32" inside the assembling channel pawls. Adjust eccentric on star wheel pusher slide.

4. Push Position of Star Wheel

In the push position the star wheel should be moved to the left 3/32" to 1/8" which means that the last matrix in the assembling channel will be at least 1/8" inside the assembling channel pawls. Adjust banking screw located above brake solenoid L-23.

5. Tension of No. 1 Finger

This tension should be 1½ pounds when the swinging front is open and 2 pounds when the swinging front is closed with the line measuring slide connected to the No. 1 finger.

6. Friction of No. 3 Finger

A force of approximately 2 pounds should be required to move this finger. Adjust spring pressure on friction pin by screw in center of flat spring on No. 3 finger.

7. Assembling Channel Front and Back Pawls

Make sure that these pawls move freely and have a light spring tension.

8. Line Measuring Slide Brake

Make sure that the fibre brake shoes on the line measuring slide hold the slide properly. Clean brake shoes and slide with typewash.

9. Assembler Star and Matrix Delivery Belt

Clean with typewash and cloth every 1000 lines.

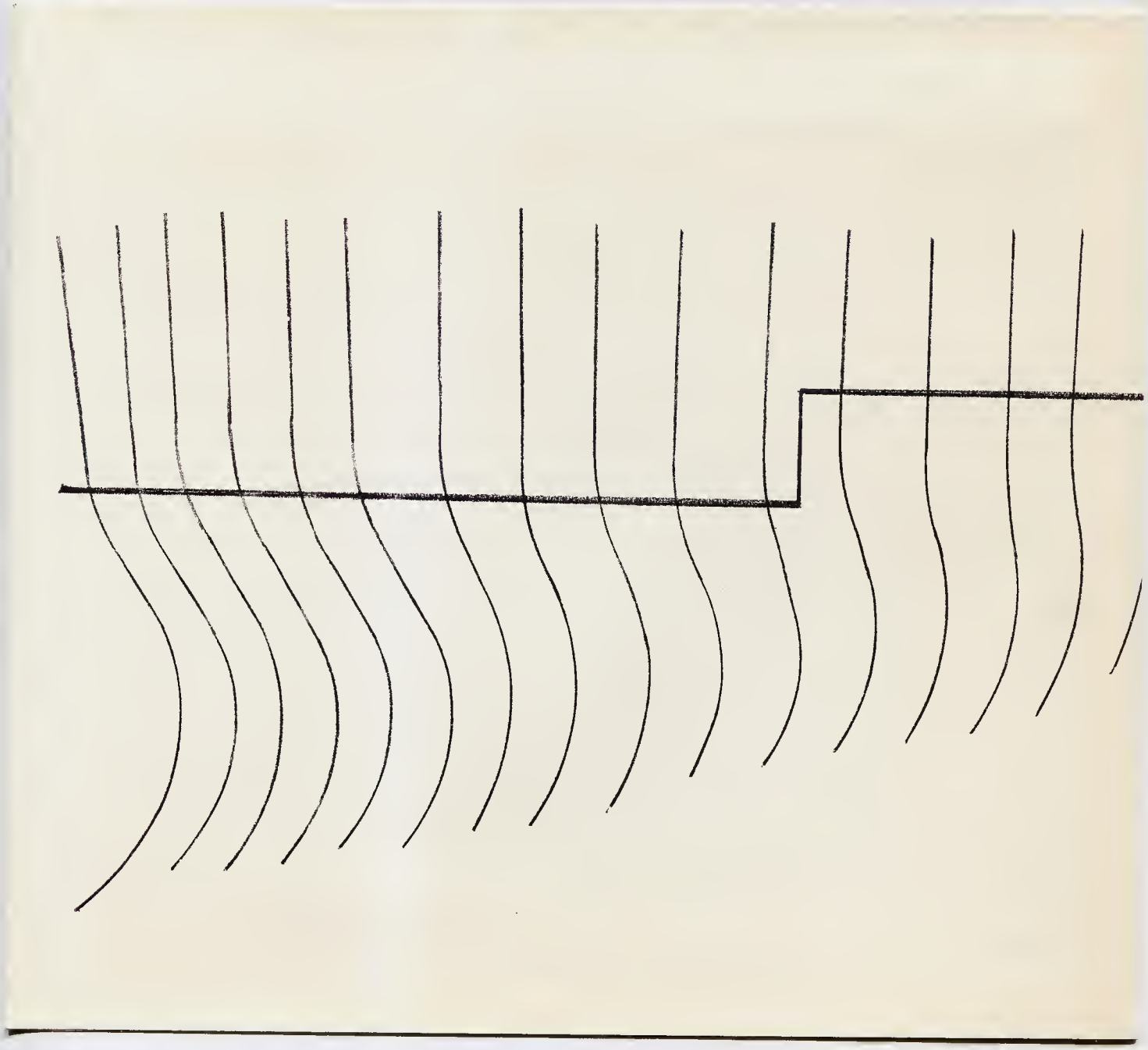
LONG HEAVY LINE
SLIP UNDER
MBLING GUIDES

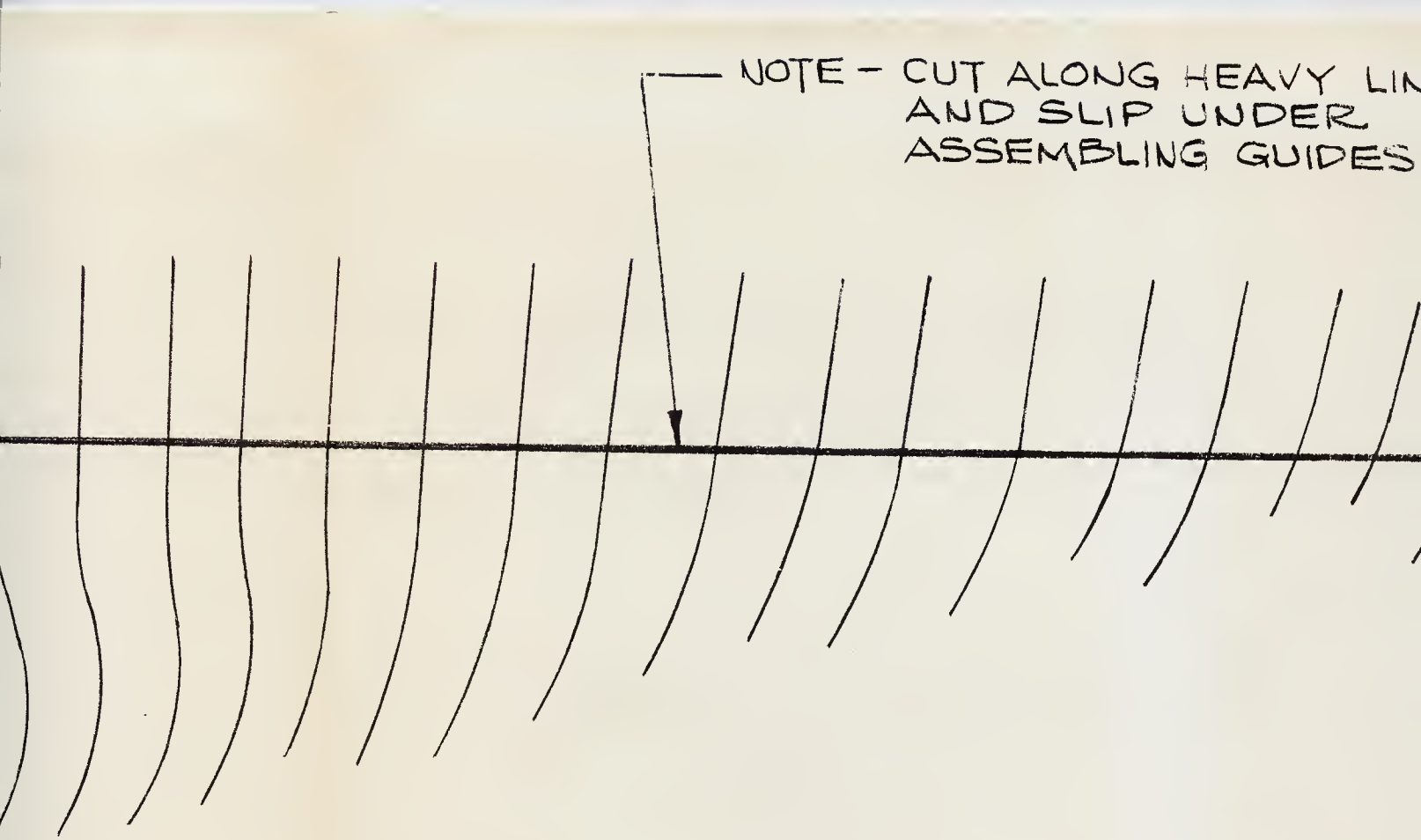
ELEKTRON TECHNICAL DATA

Sales-Service Department • Mergenthaler Linotype Co. • Brooklyn 5, N.Y.

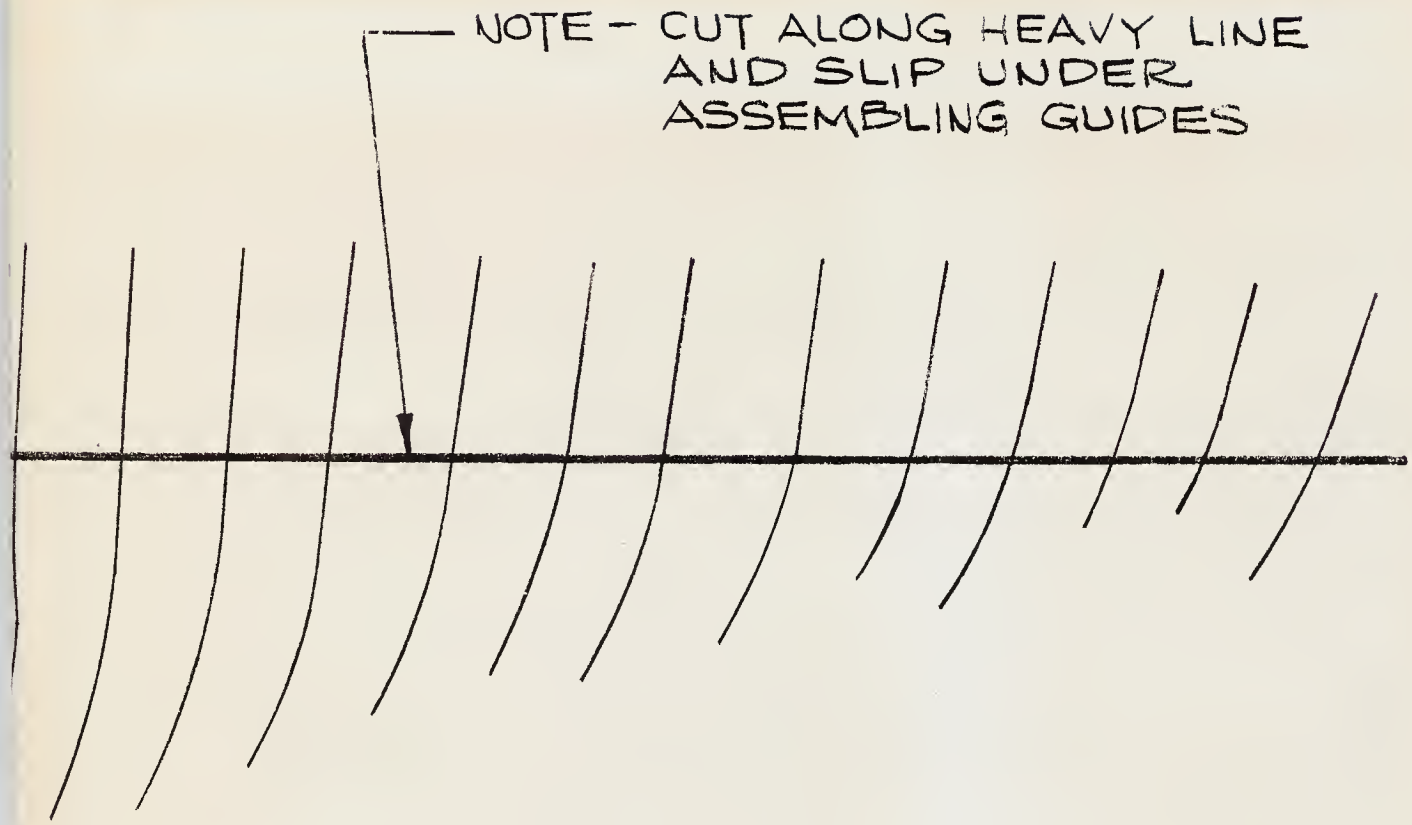
DAILY CHECK LIST FOR THE ELEKTRON

1. Assembler Chute Finger





TEMPLATE
ELEKTRON ASSEMBLER FRONT



TEMPLATE
ELEKTRON ASSEMBLER FRONT